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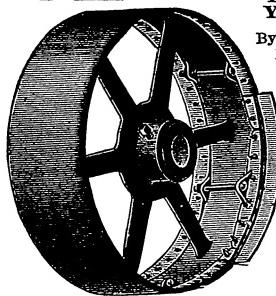
New York, Thursday, August 2, 1894.

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Reading Matter Contents.....page 200
Classified List of Advertisers.... " 109
Alphabetical Index to Advertisers " 113
Advertising and Subscription Rates " 217

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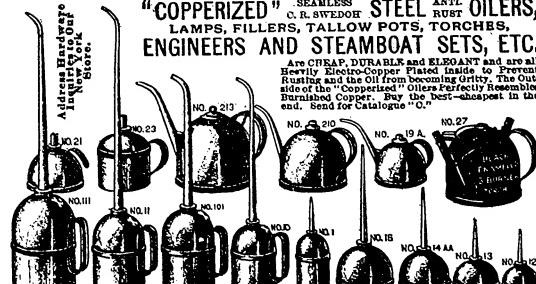
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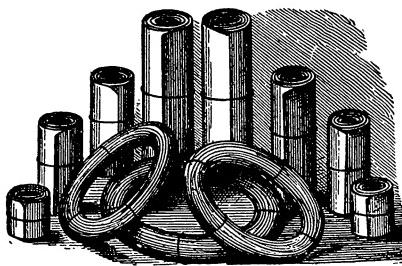
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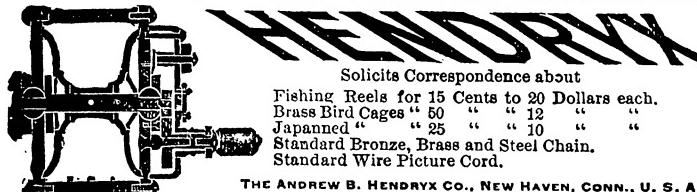
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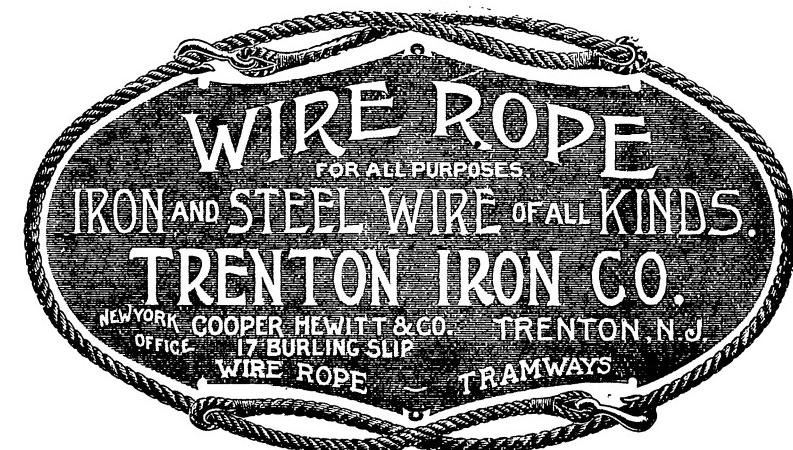
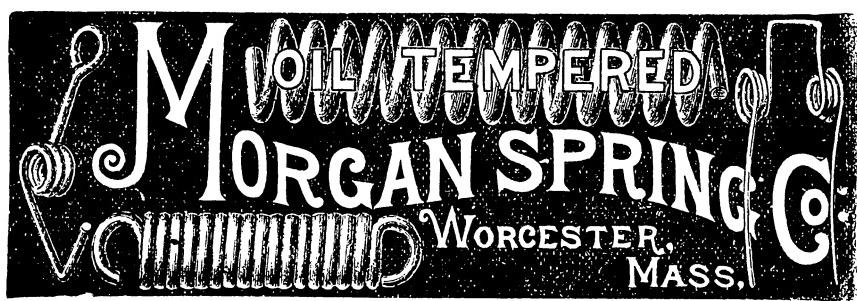
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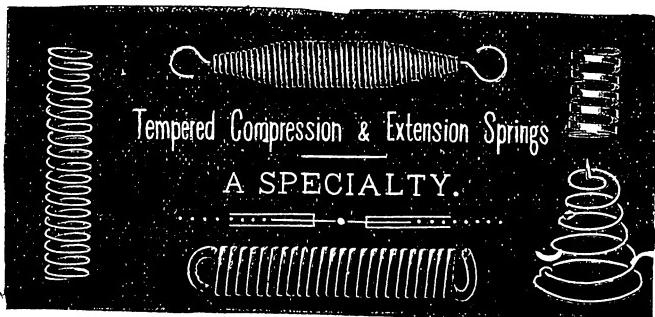
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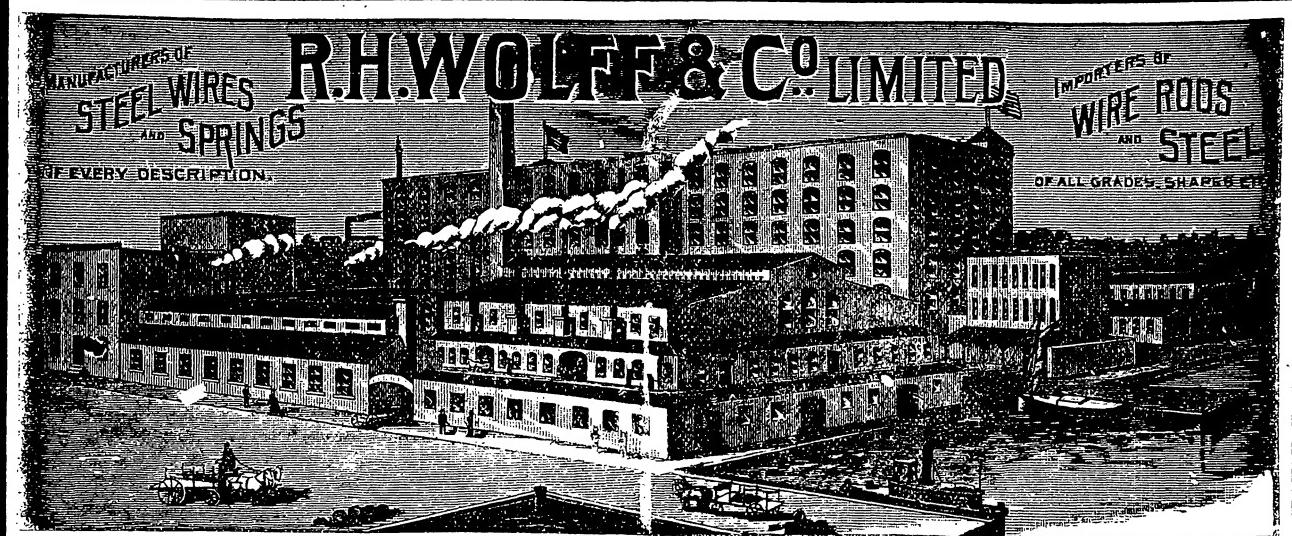
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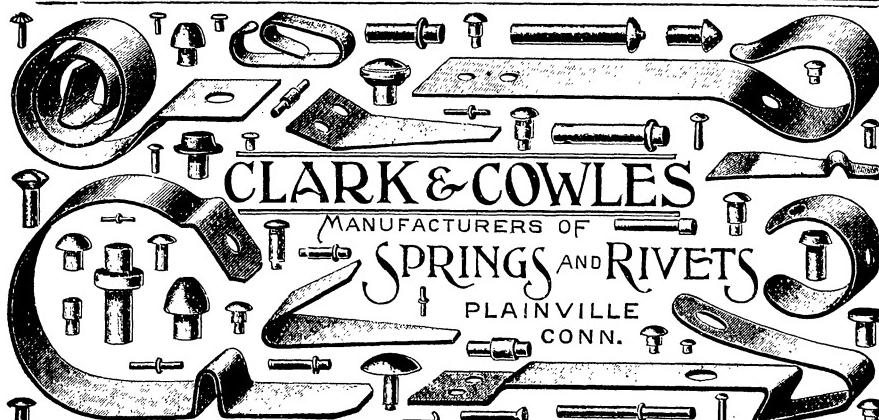
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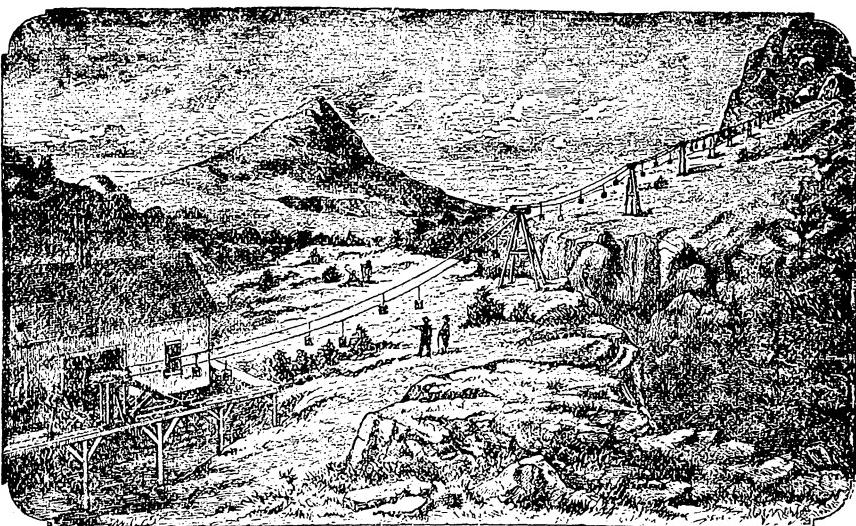
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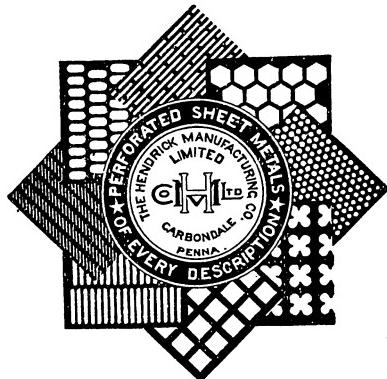
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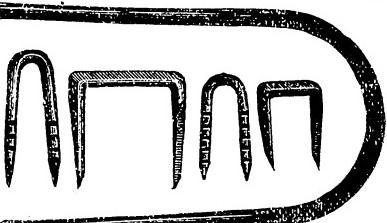
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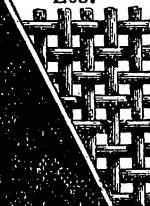
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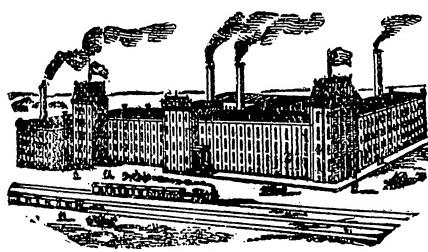
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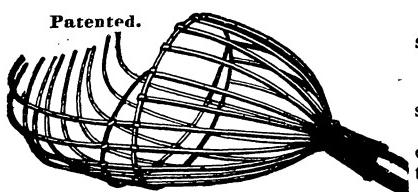
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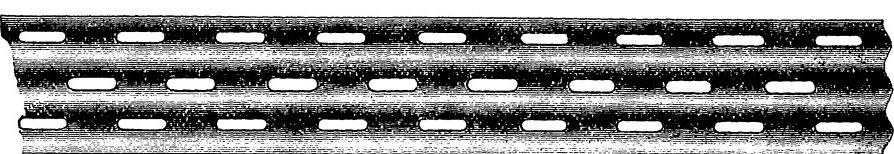
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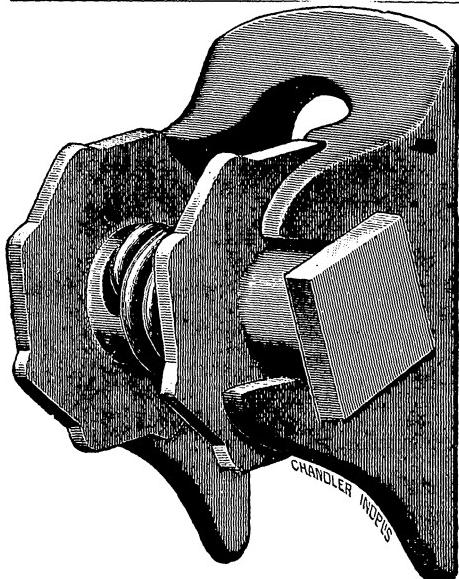
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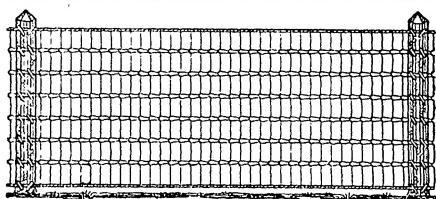
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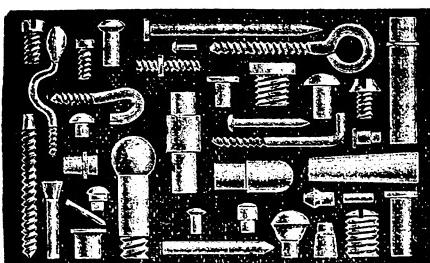
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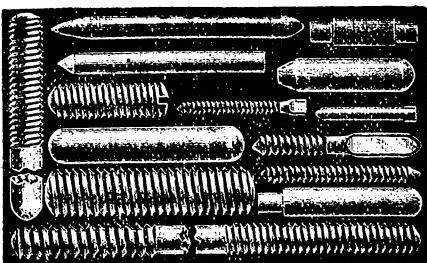
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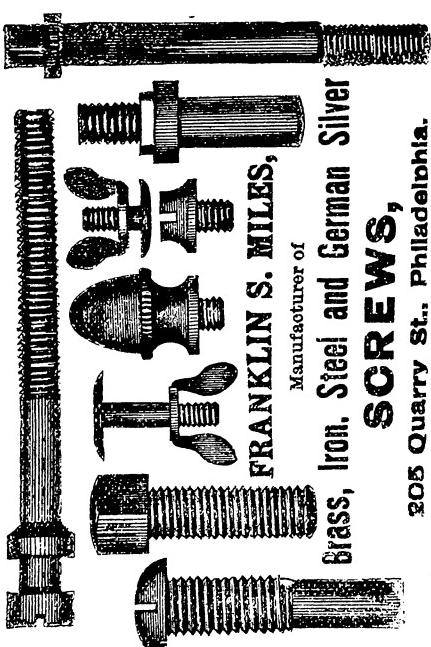


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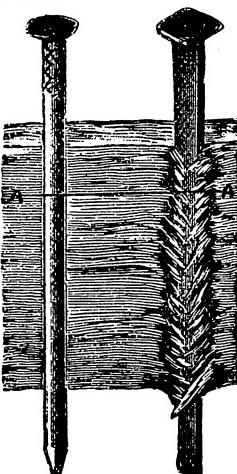
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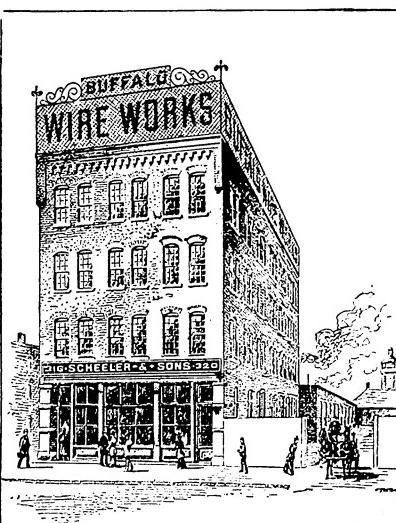
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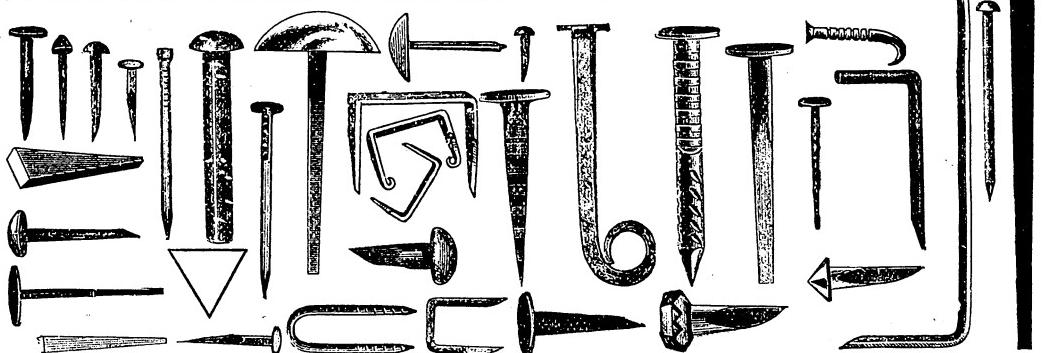
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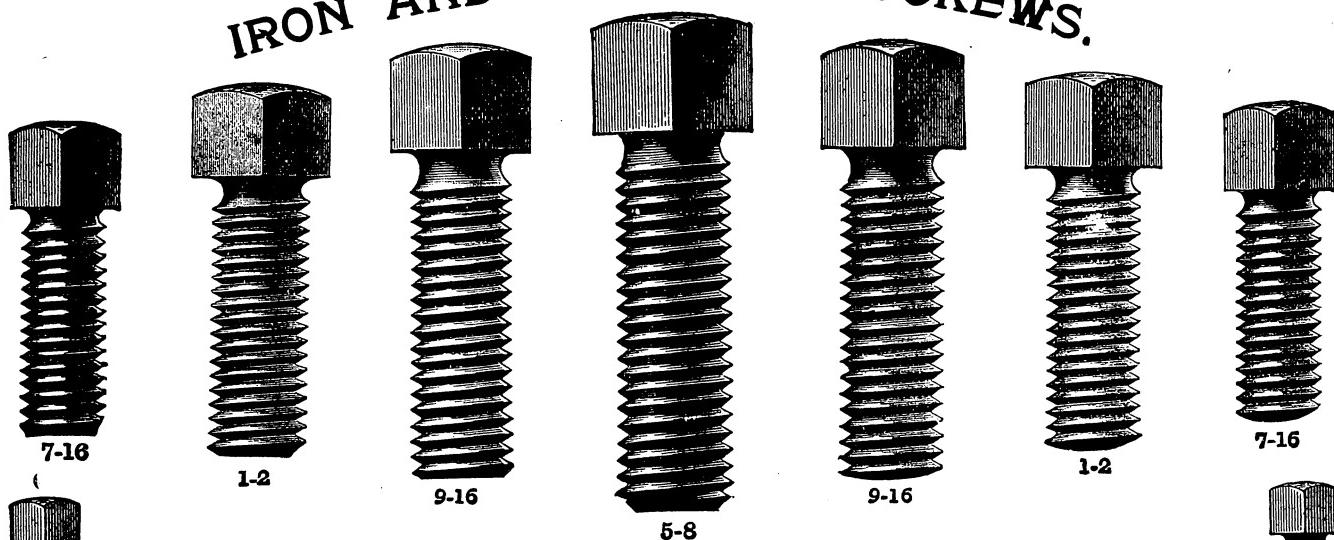
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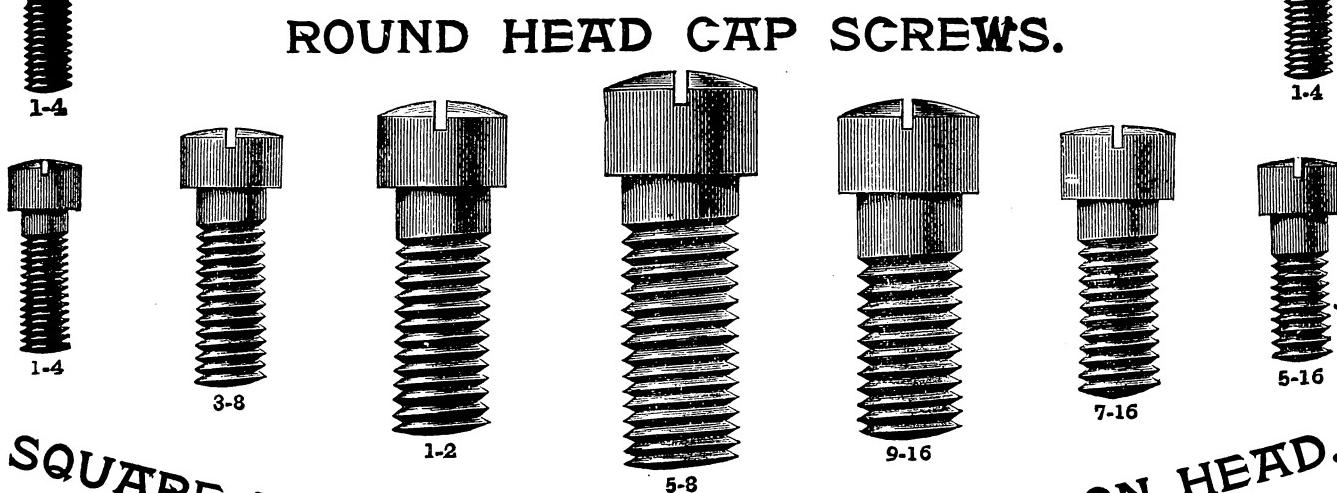
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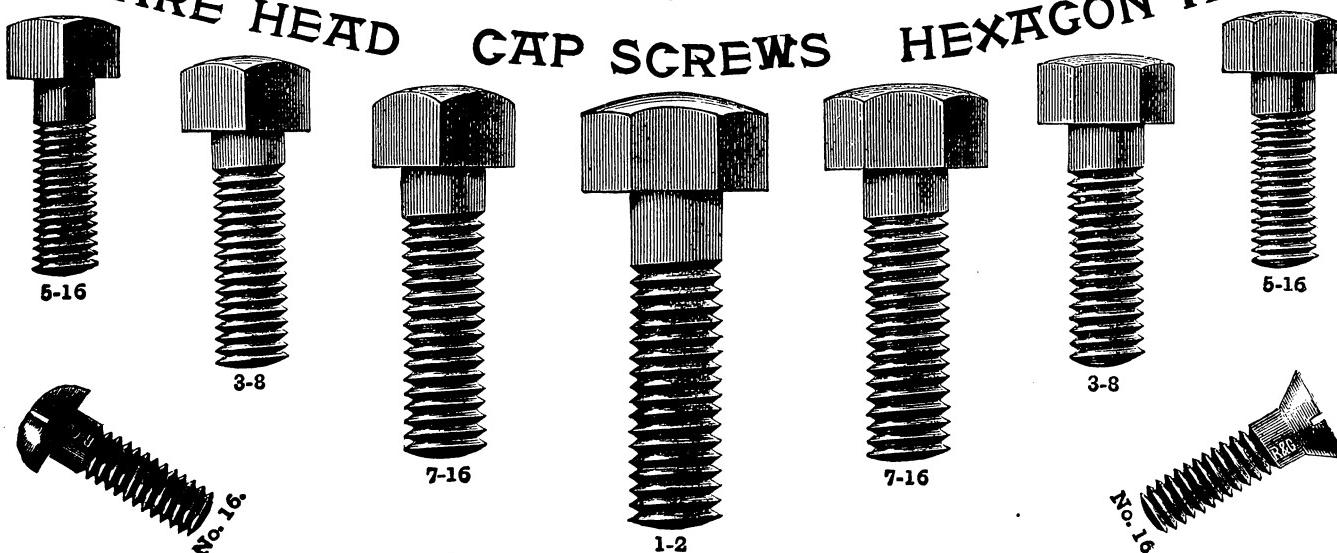
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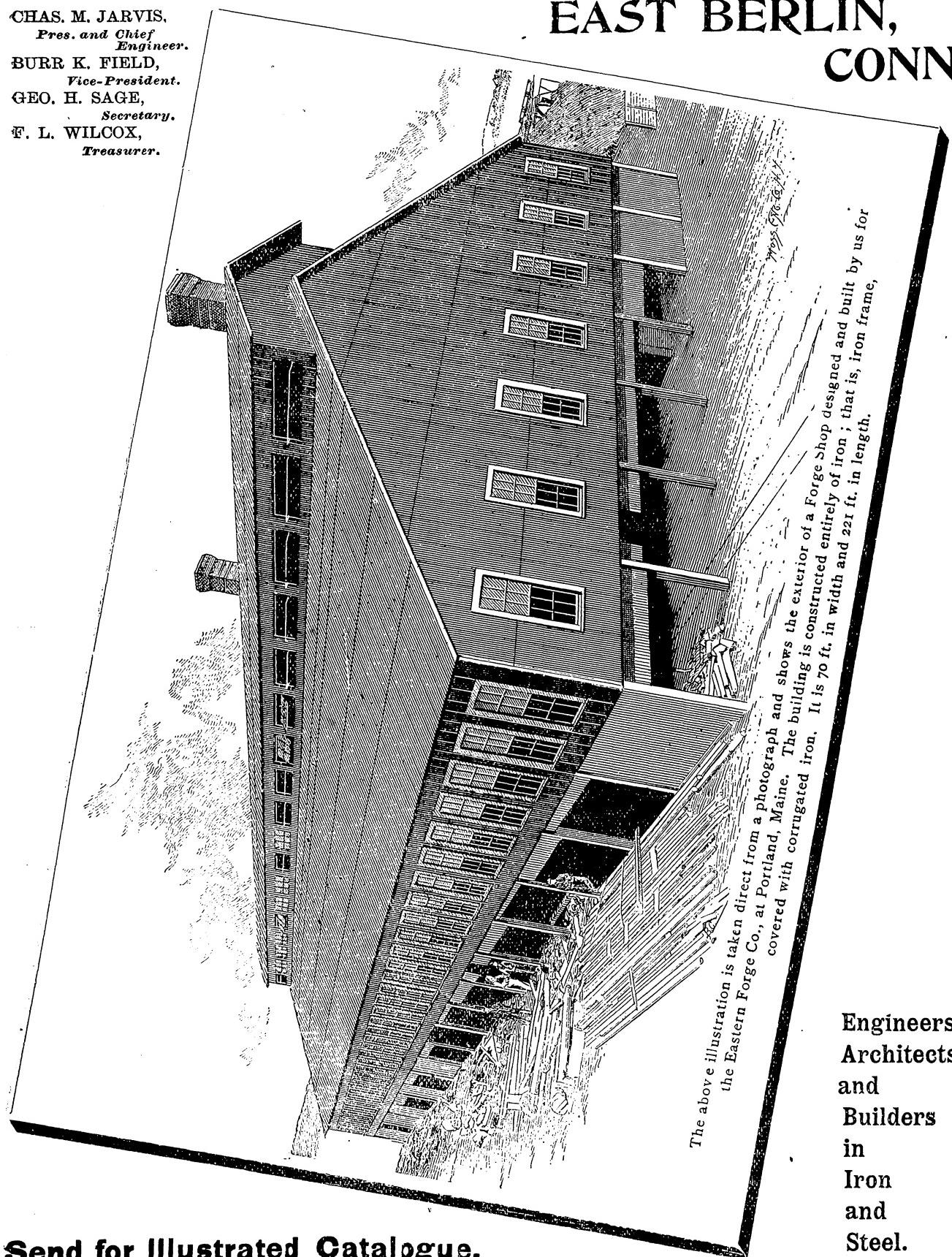
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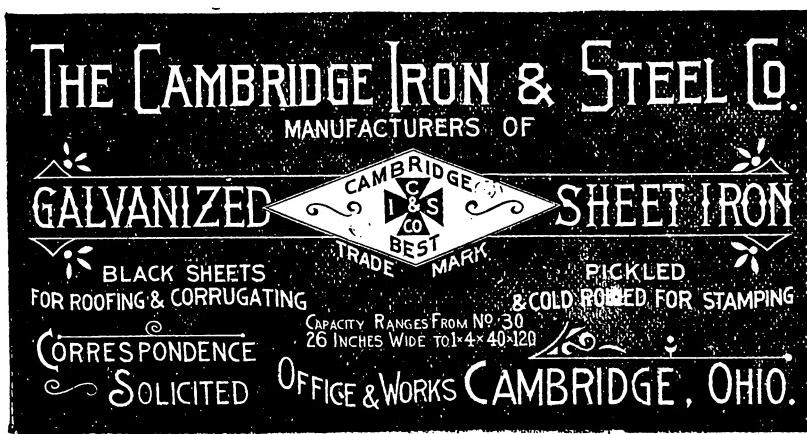
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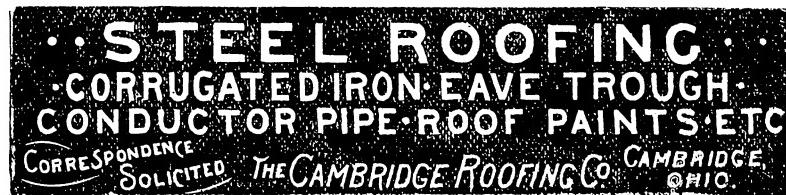
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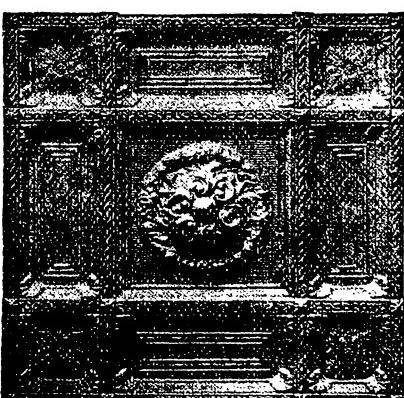
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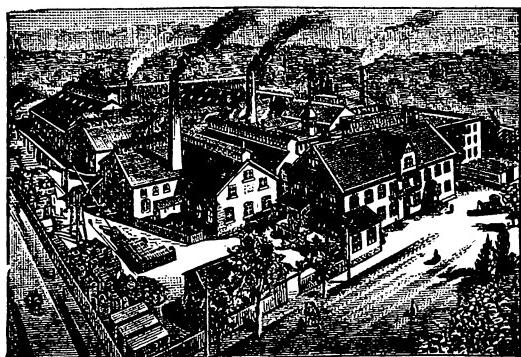
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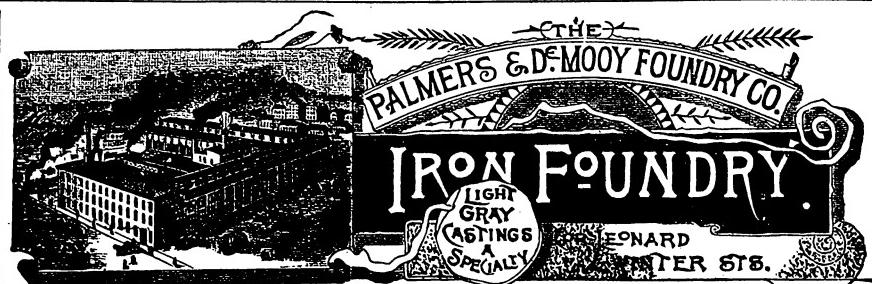
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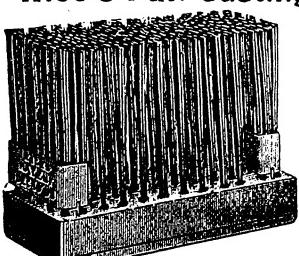
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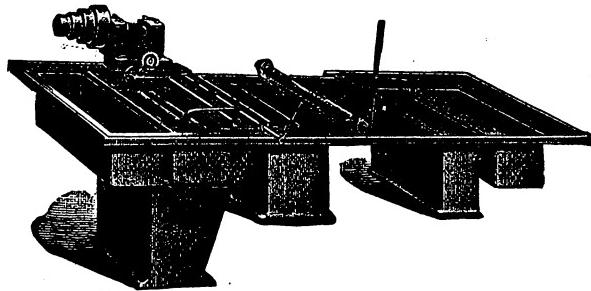
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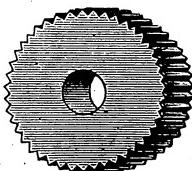
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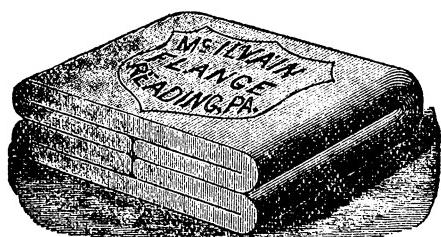
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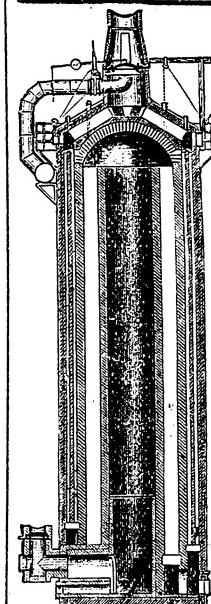
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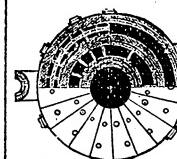


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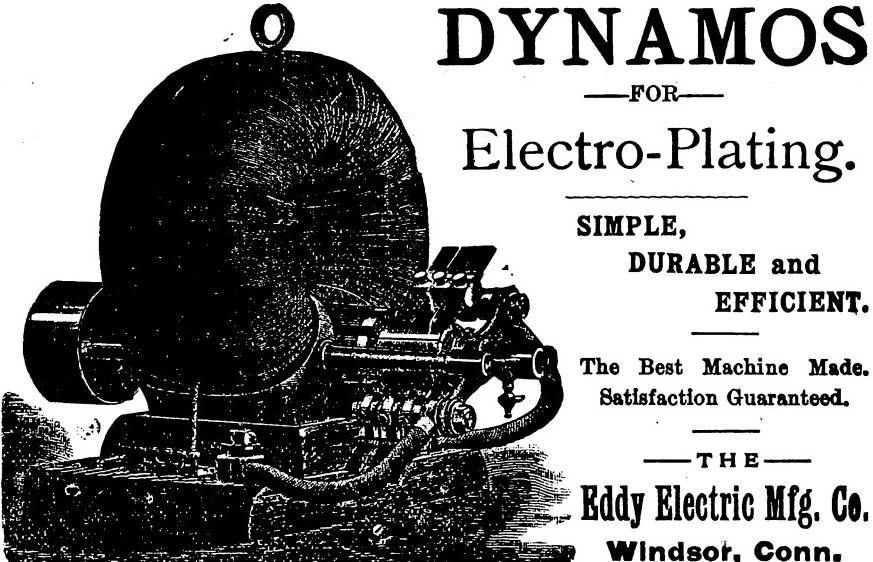
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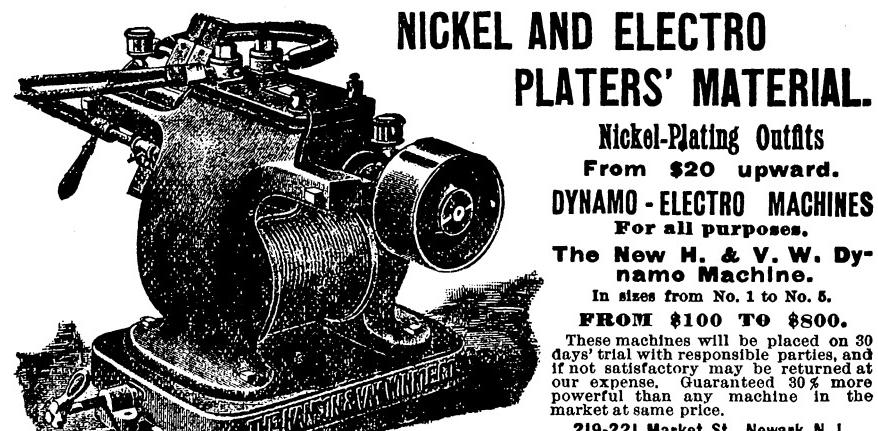
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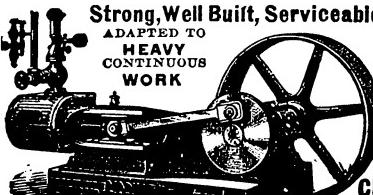
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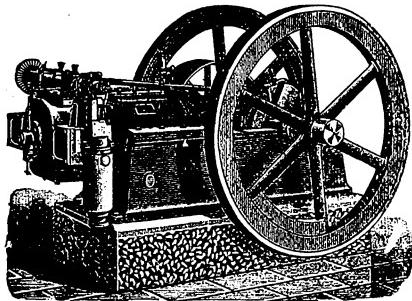
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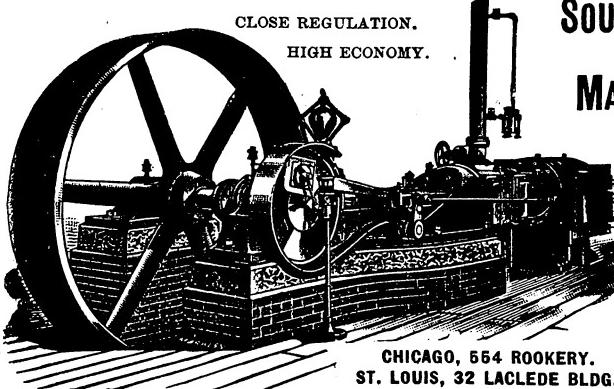
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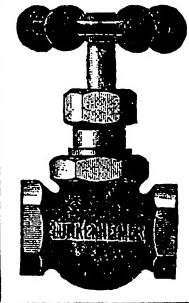
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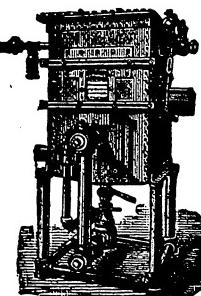
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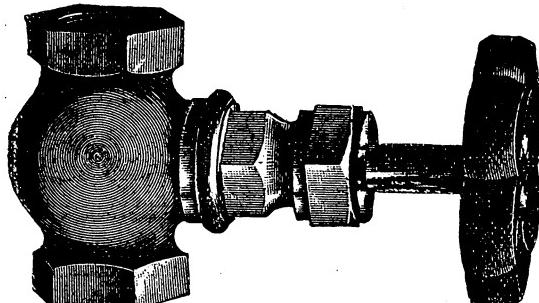
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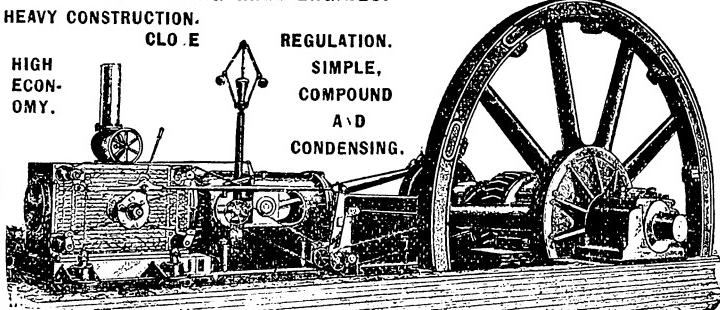
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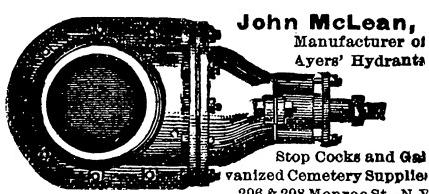
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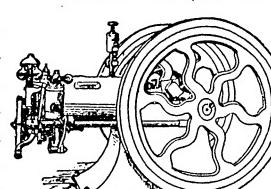
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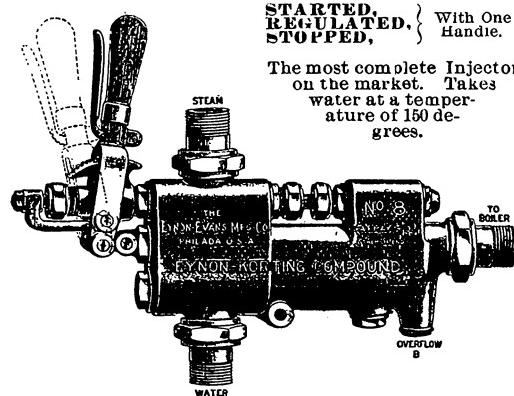
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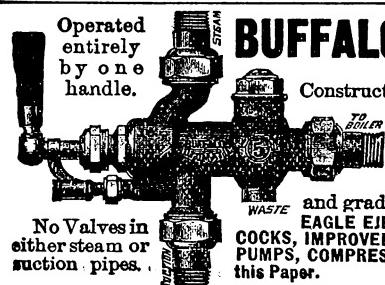
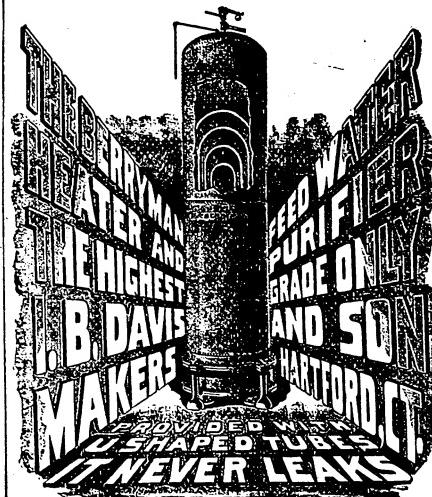
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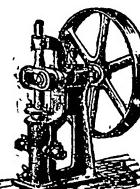
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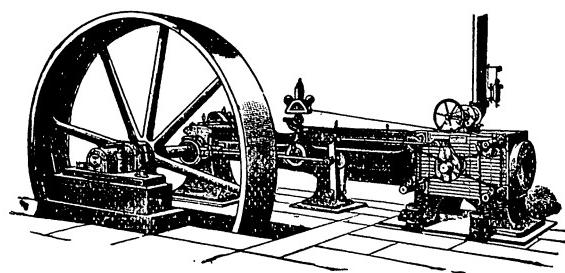
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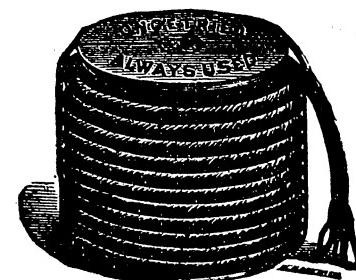
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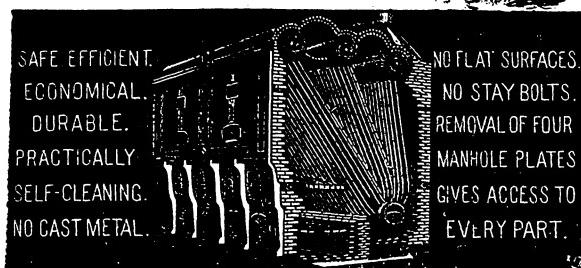


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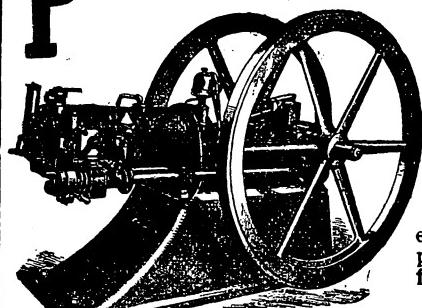


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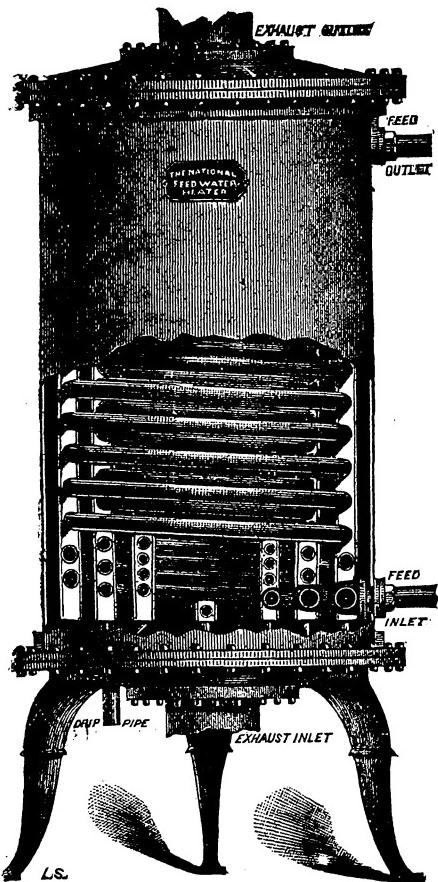
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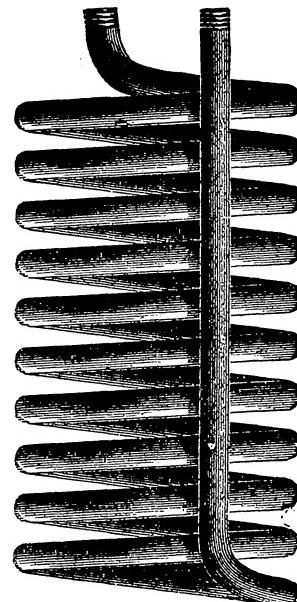
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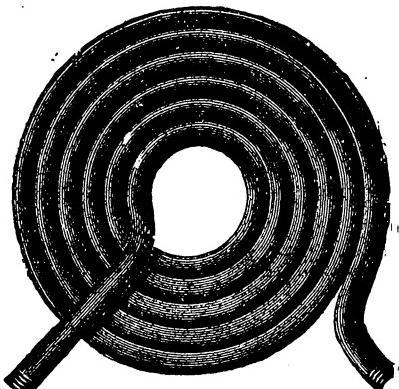
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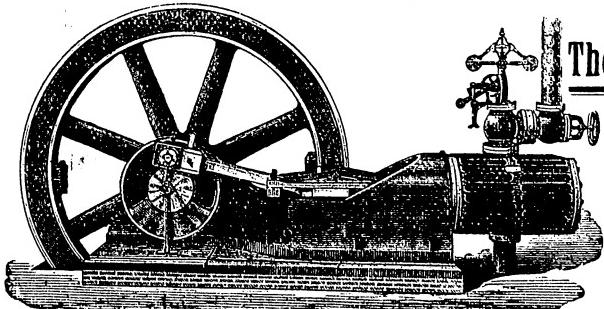
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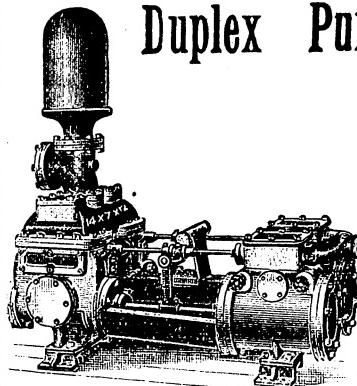
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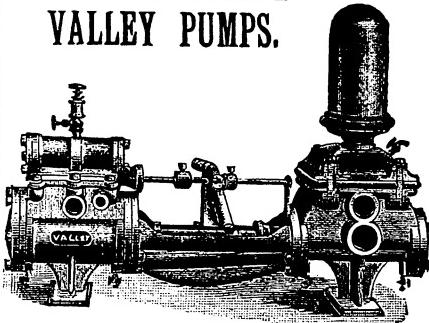
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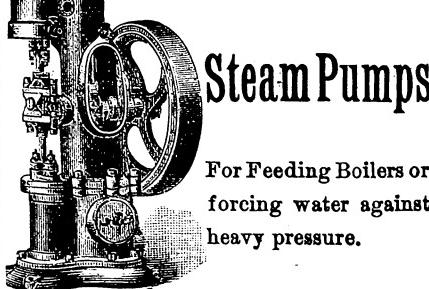
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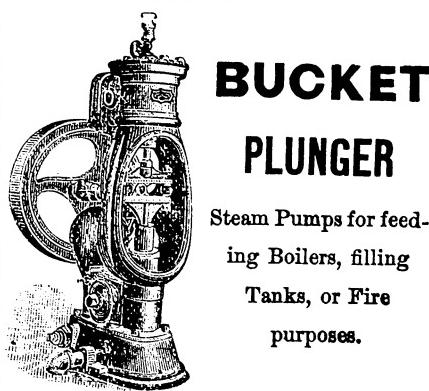


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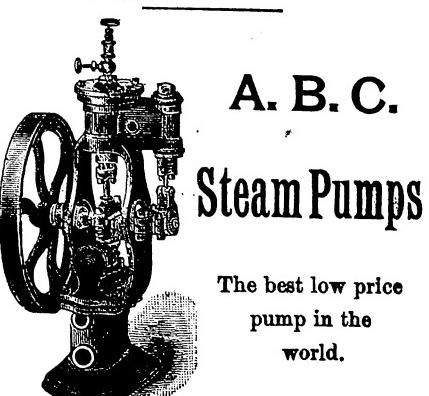
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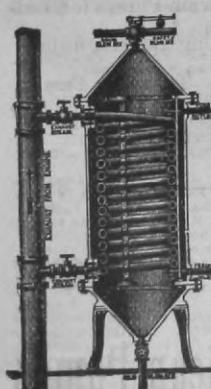
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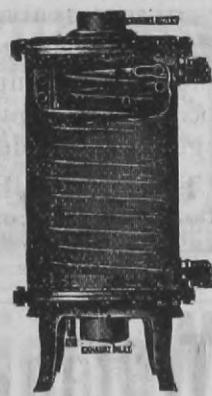
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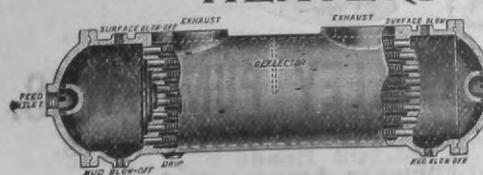


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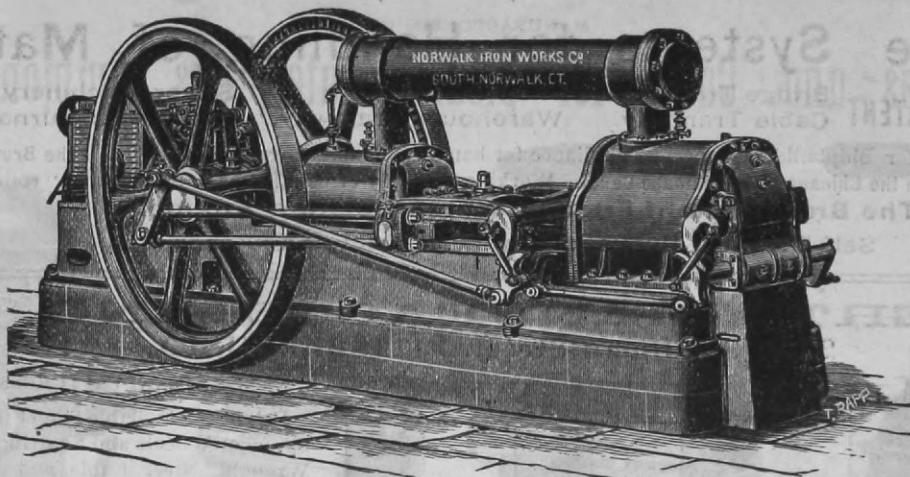
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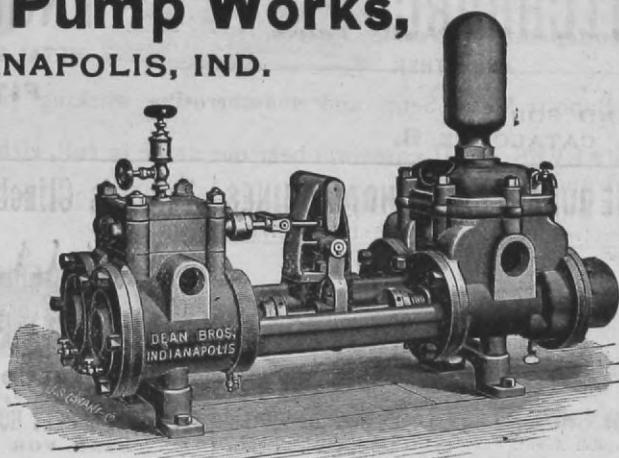
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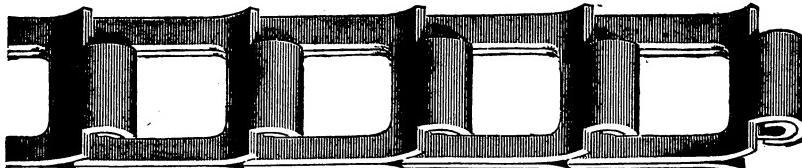
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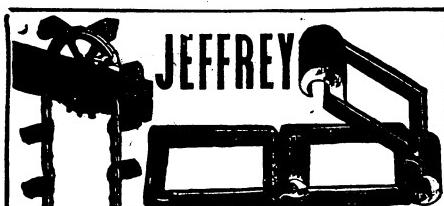
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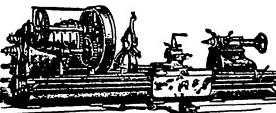
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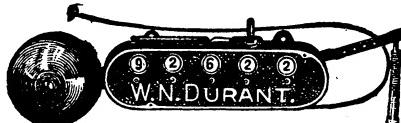
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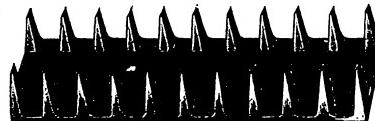
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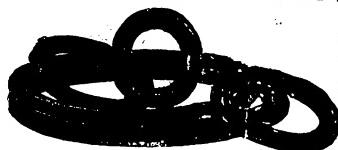
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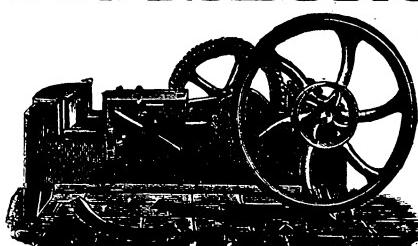
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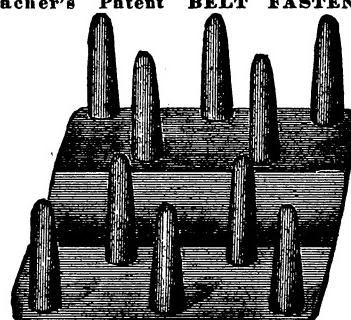
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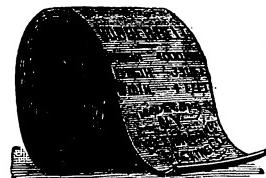


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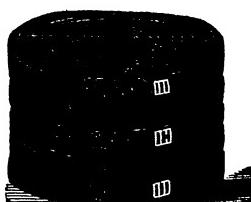


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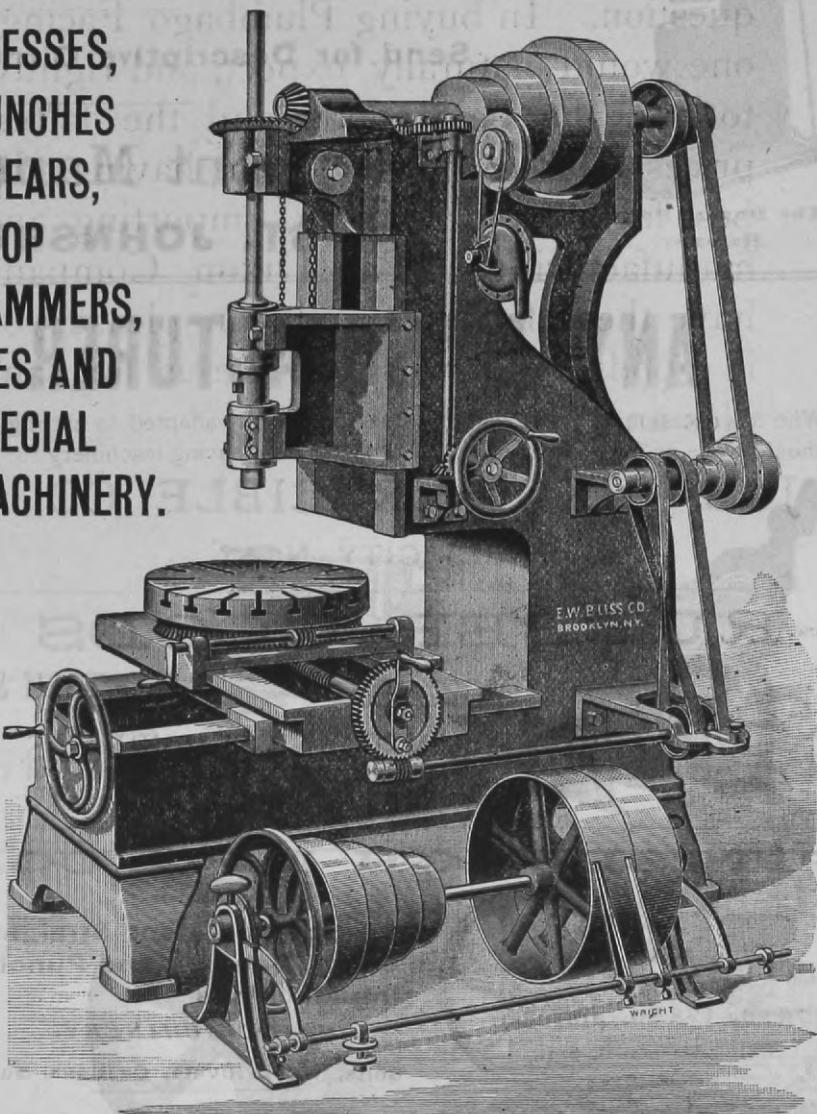
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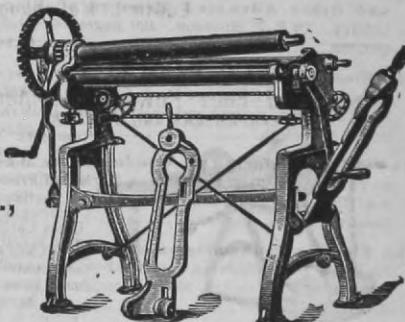
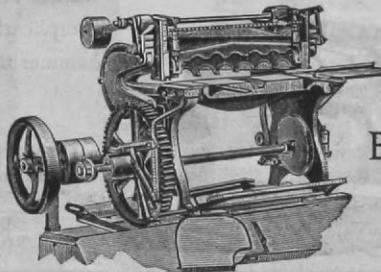
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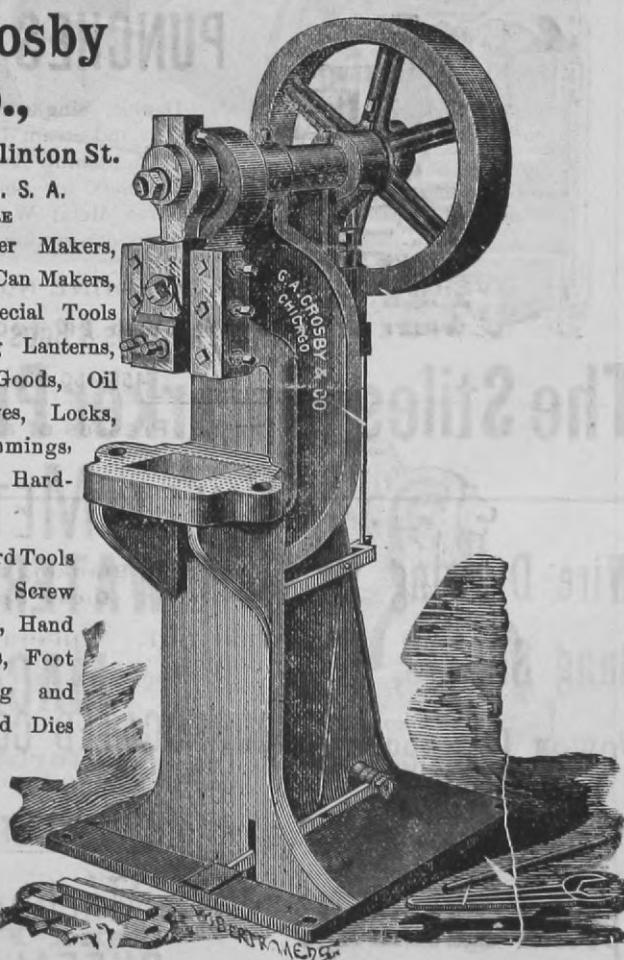
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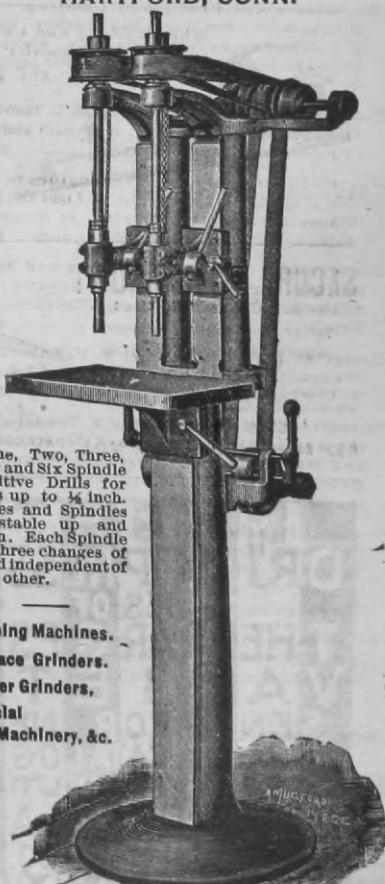
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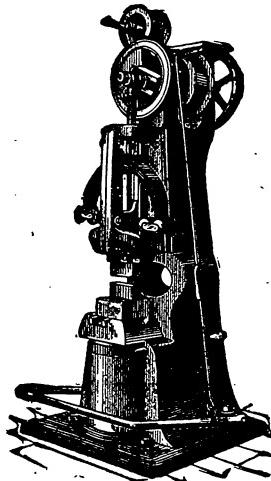
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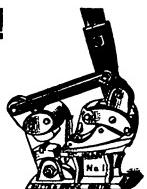
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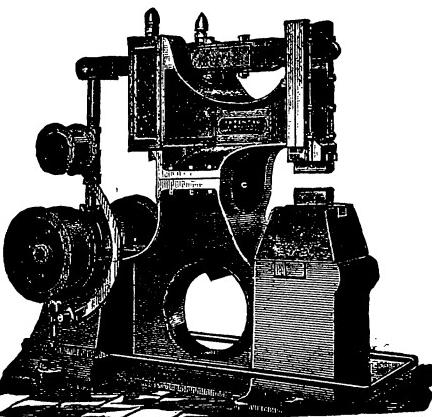
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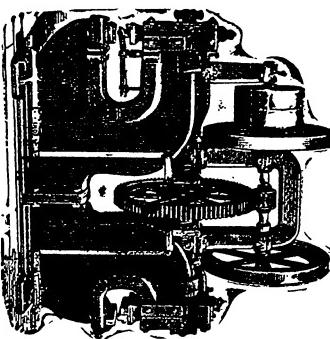


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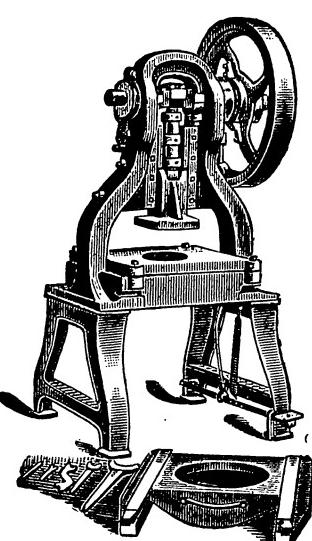
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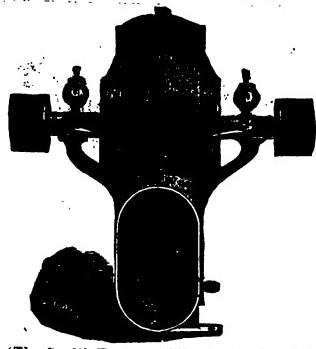
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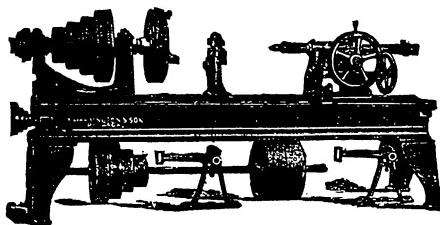
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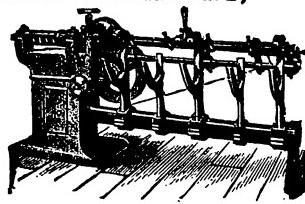
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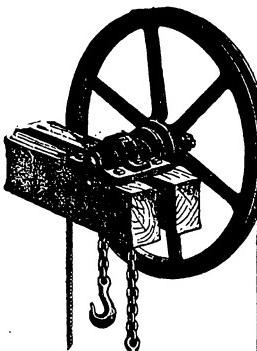
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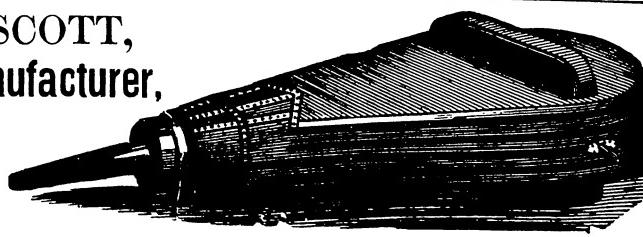


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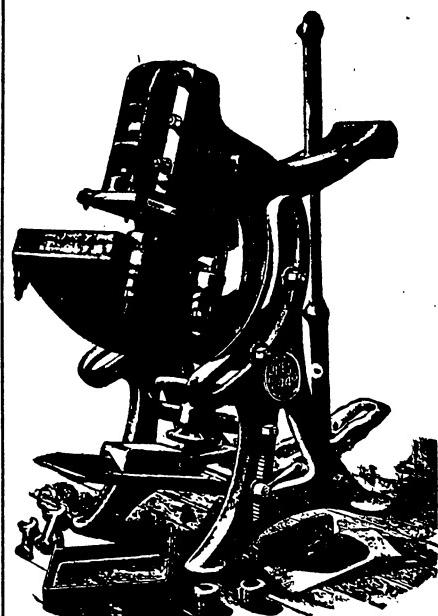
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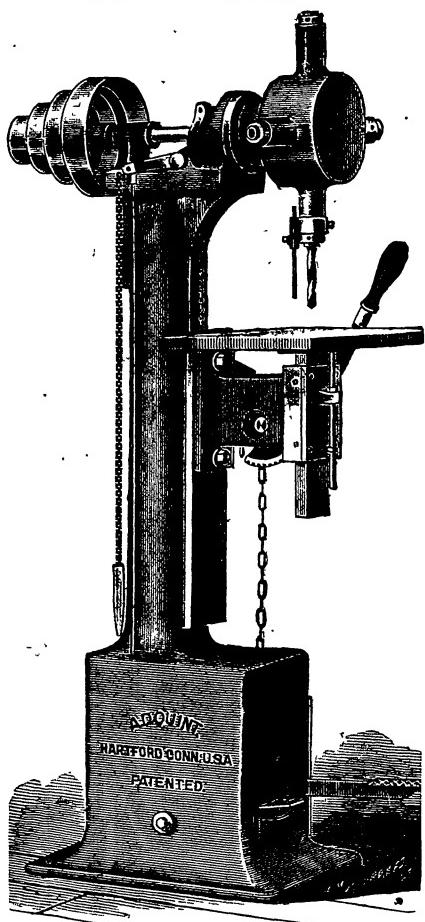
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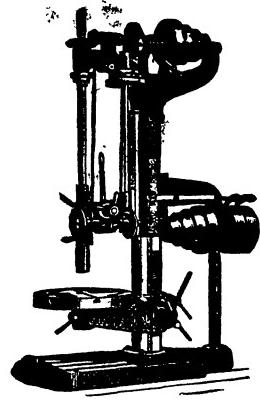
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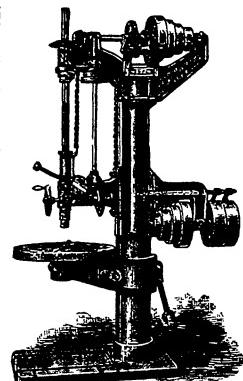
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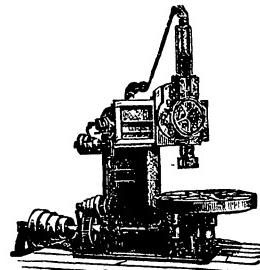


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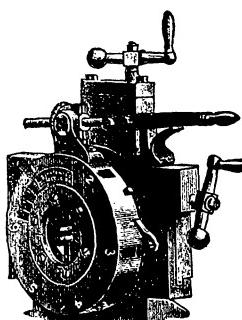
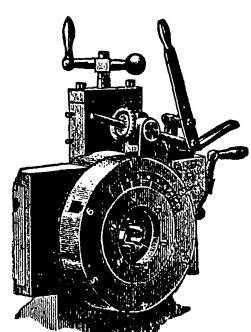
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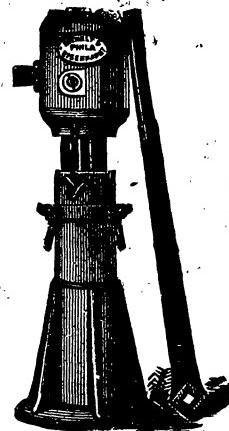
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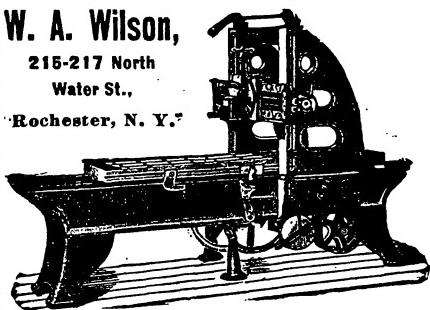


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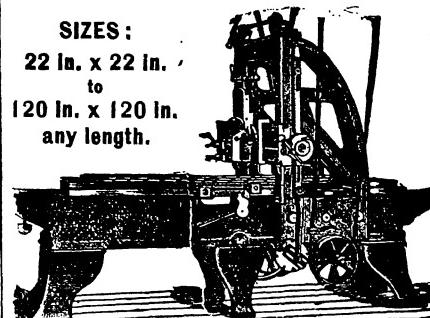
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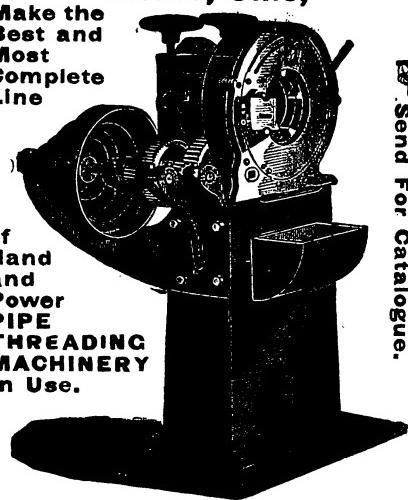
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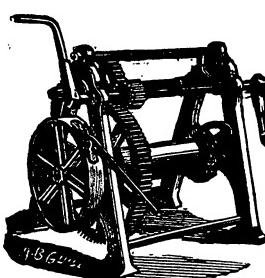
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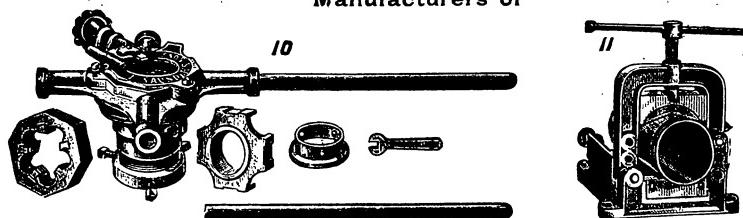
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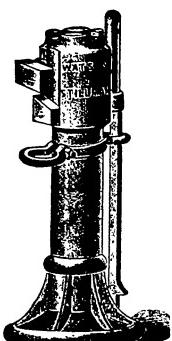
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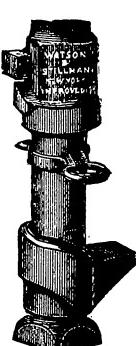
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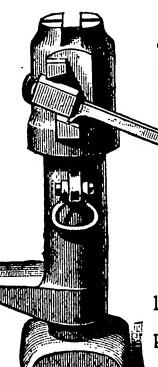


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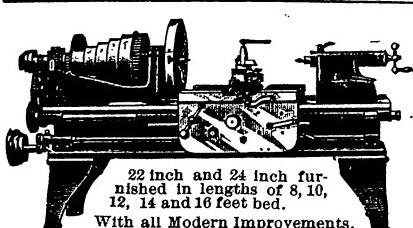
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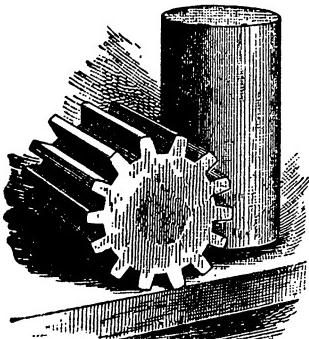
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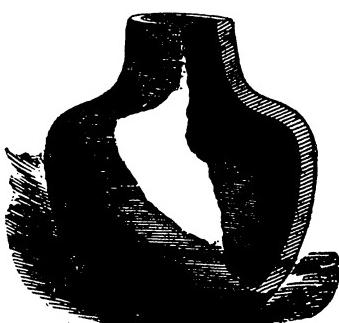
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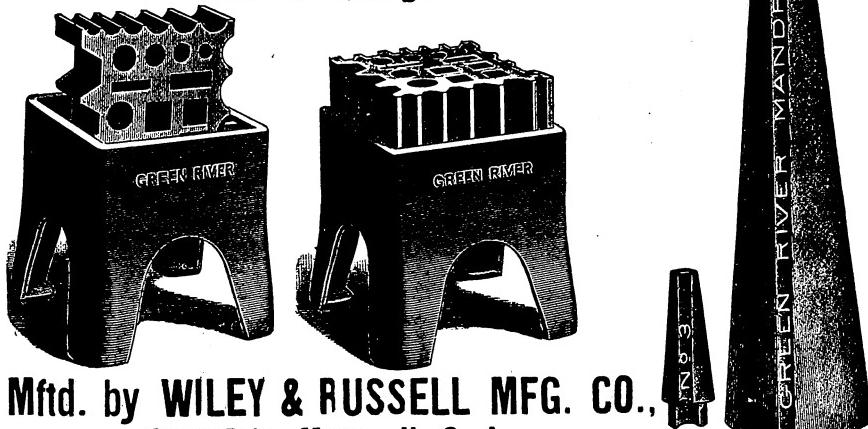
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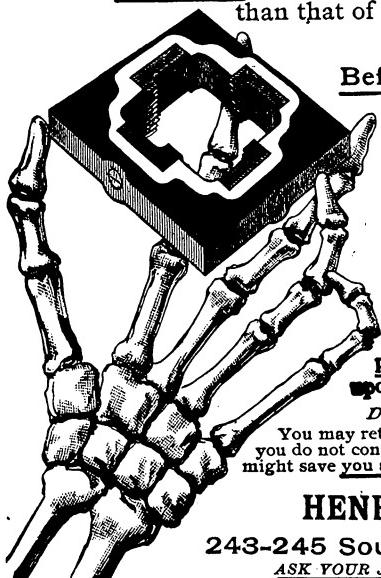
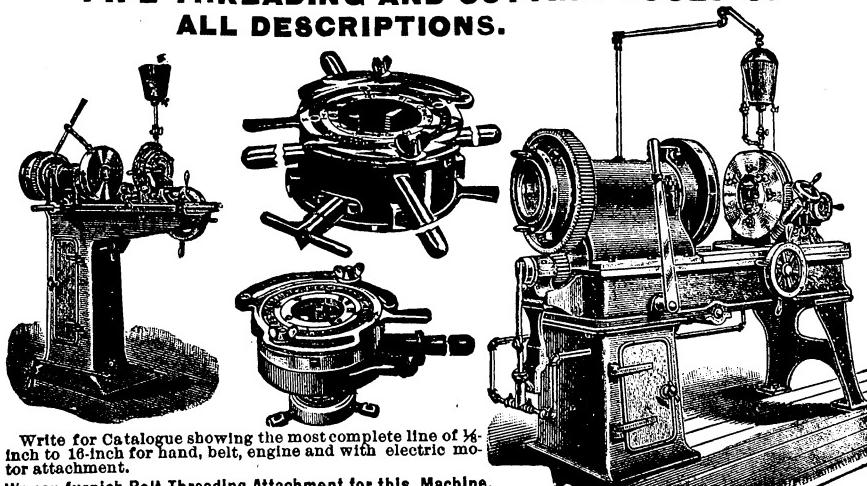
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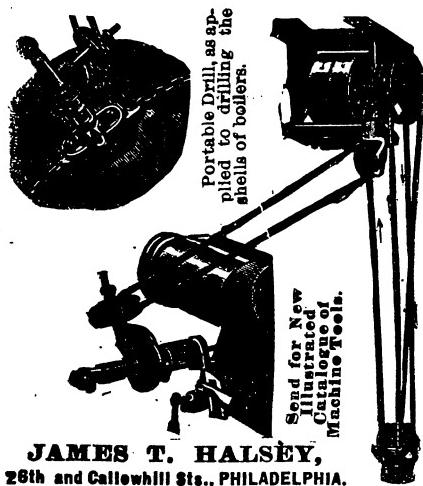
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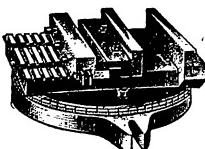
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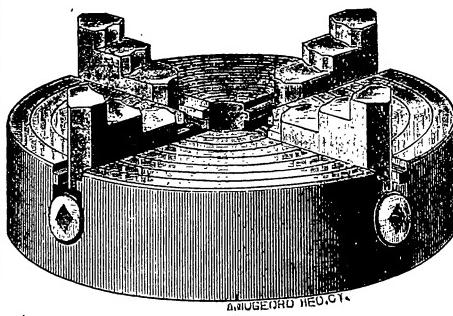
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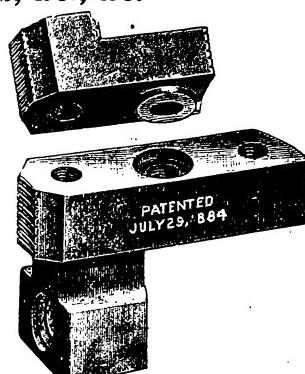
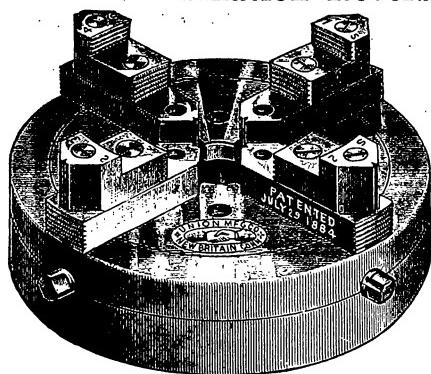
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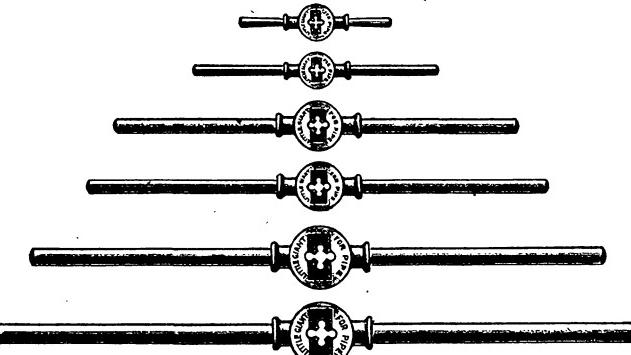
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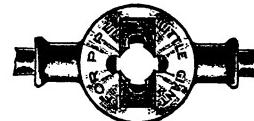
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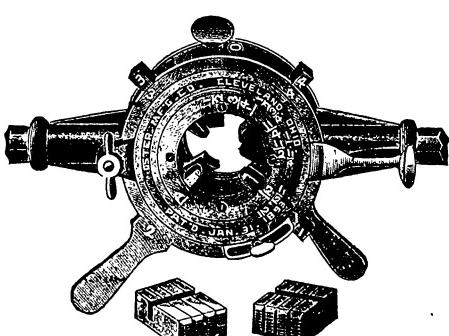
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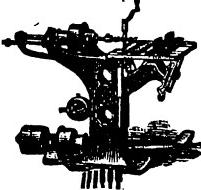
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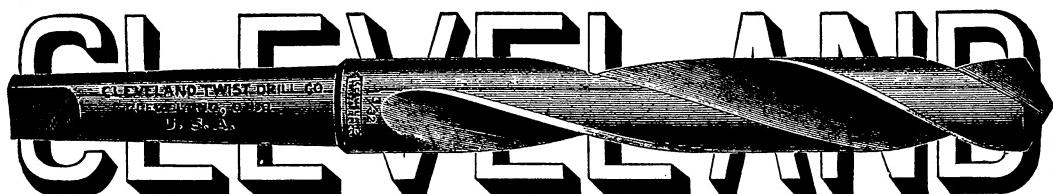
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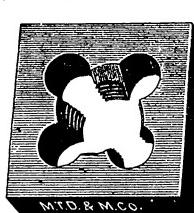


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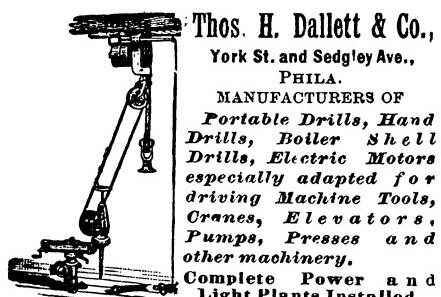
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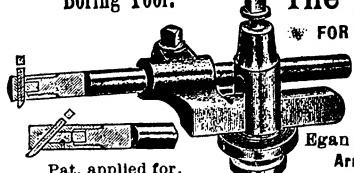
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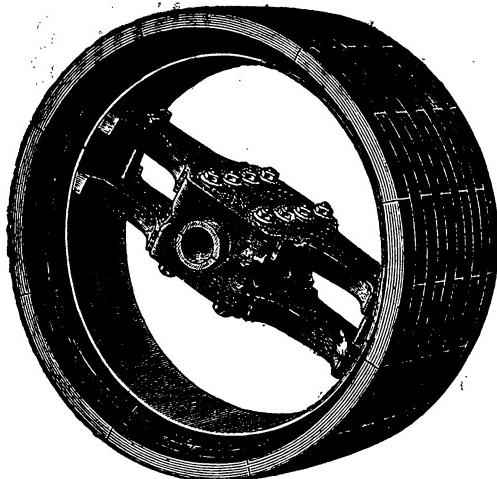


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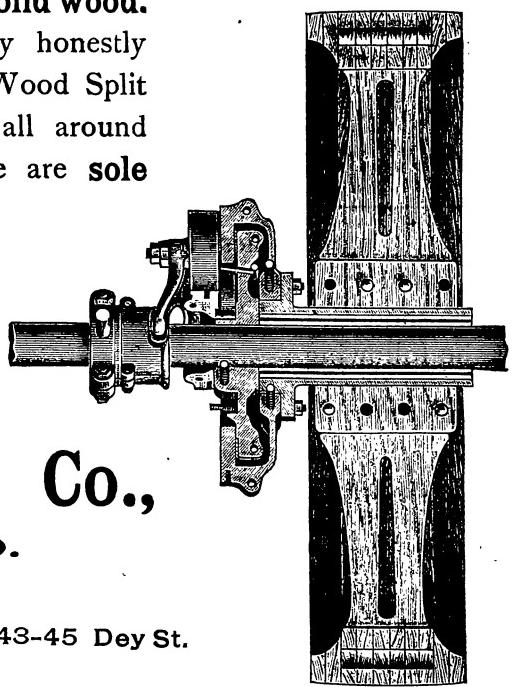
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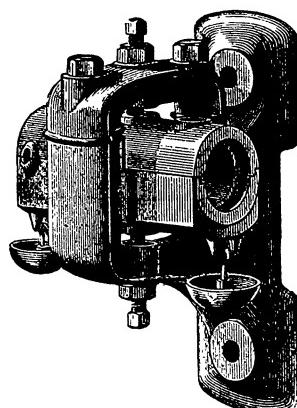
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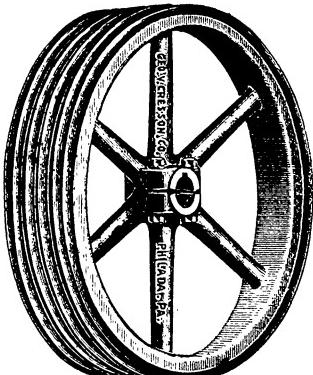
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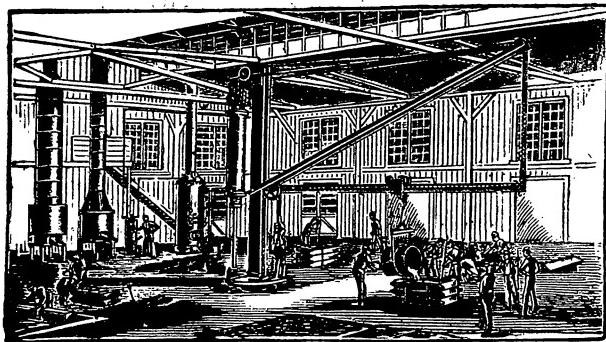
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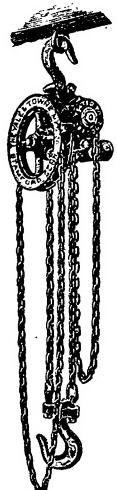
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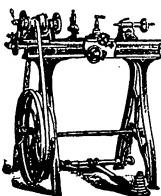
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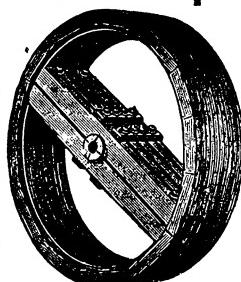


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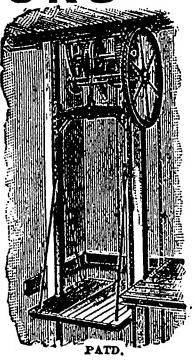
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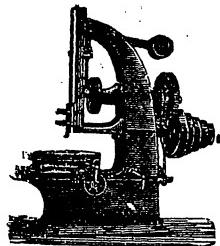
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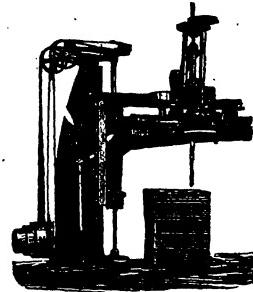
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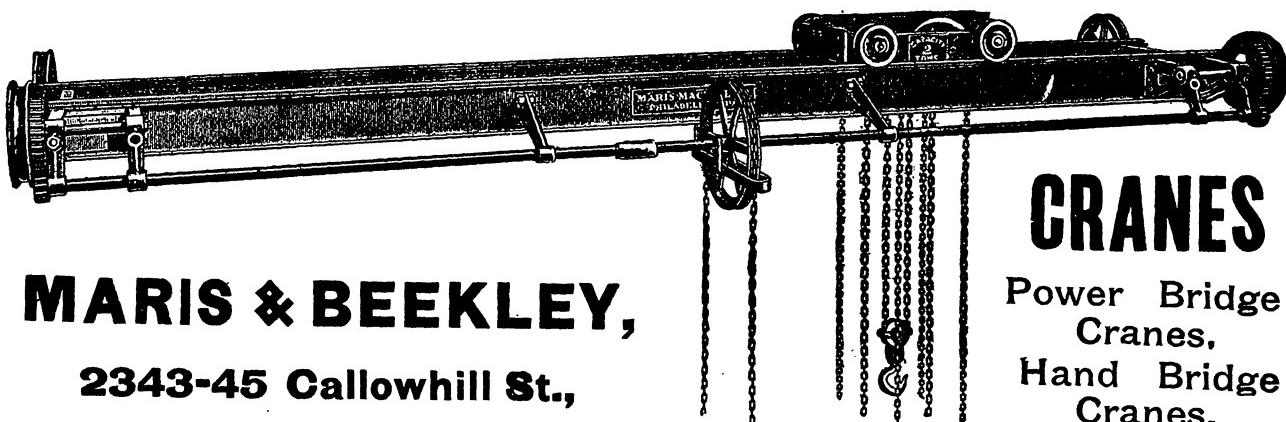
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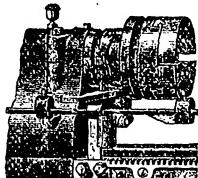
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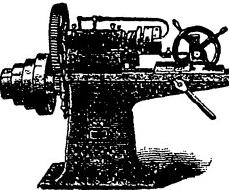
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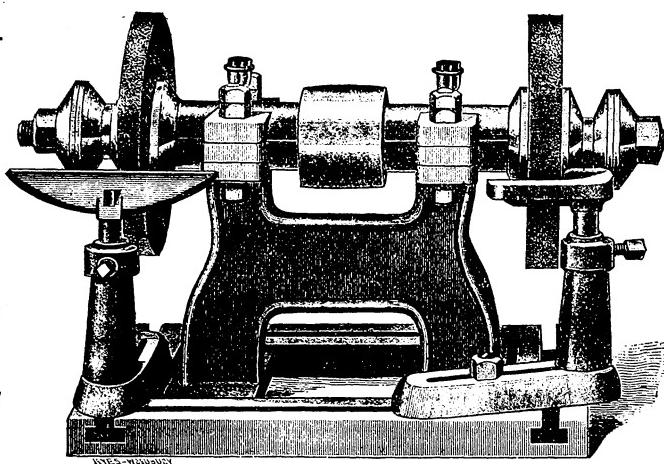
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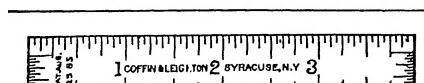
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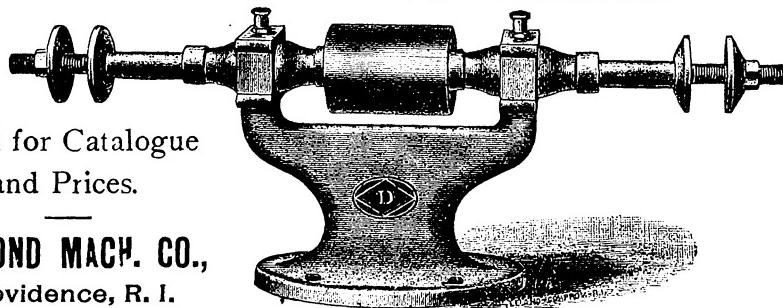
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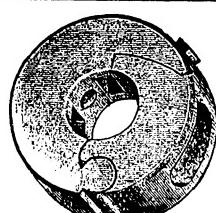
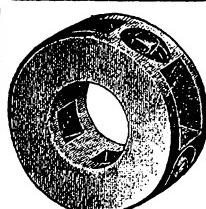
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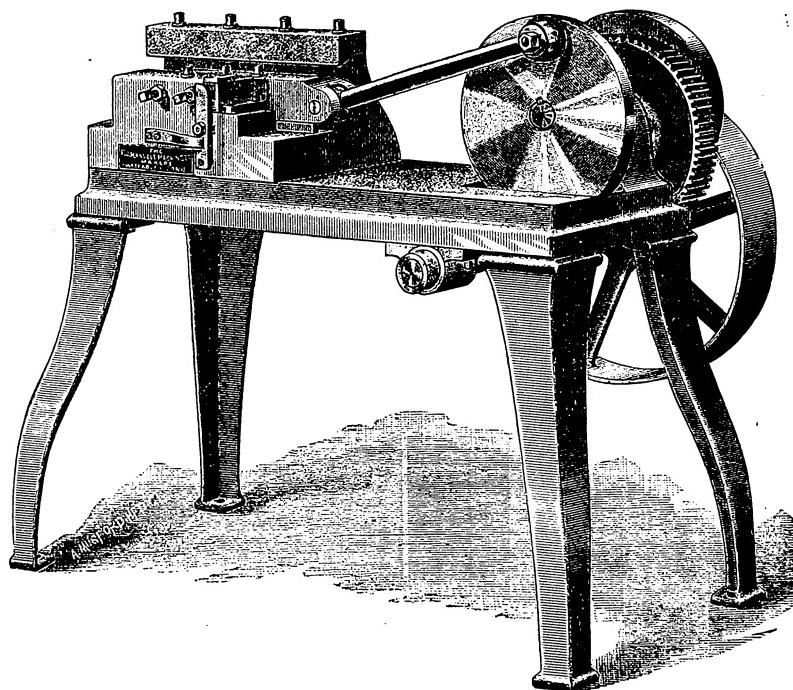
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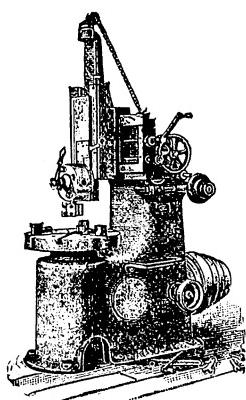
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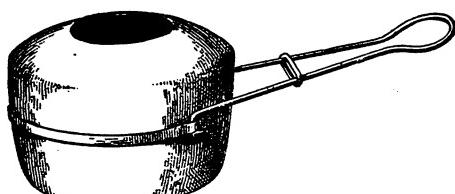


Fig. 108.—Clamp for Holding Tea Kettle while Being Tinned.

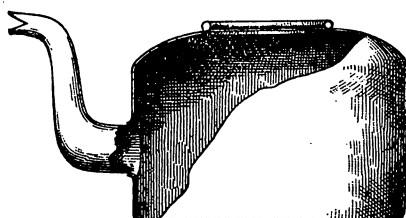


Fig. 110.—Tea-Kettle, Showing Spout Attached.



Fig. 107.—Planishing Tea-Kettle Side.

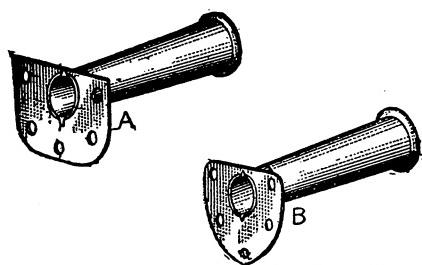


Fig. 54.—Way to Put the Flaps On.

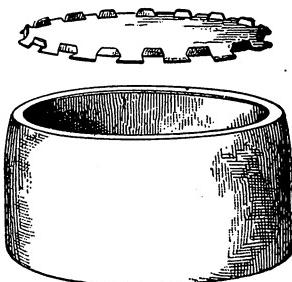


Fig. 105.—Putting in Bottom.

The above are Specimen Illustrations from "The Art of Coppersmithing," and indicate the Practical Nature of the Treatise, and how it Goes into All the Details of Workmanship.

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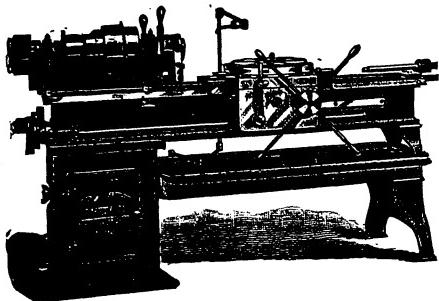
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 Plate, Tank and Bar Iron, Waste—White,
 Colored and Wool.
 Bank of Commerce Bldg. St. Louis, Mo.

"Expert" has been defined—by some incendiary: "One who is prepared to prove anything for a satisfactory consideration." Co-incidentally, it is a significant fact that the SELF-CONFESS'D "ADVERTISING 'EXPERT'" with a unanimous voice now limits its claims to simple OMNISCIENCE, or to a felicitous blending of OMNISCIENCE with OMNIPOTENCE. So much for the abstract. For obvious reasons I am not an "Expert," while a very mild type of OMNISCIENCE will instantly recognize the absurdity of any claims I might advance to such an attribute. Treating of Advertising matters, I have issued two publications—rather more perhaps than circulars, considerably less than books, neither of them works of genius, both of them obviously and avowedly FINITE. Number 2—treats of the Trade Circular, Number 9—of some phases of Newspaper and Periodical Advertising. Both will be mailed to those whose longing for light would seem to warrant the sending of five 2-cent Postage Stamps to the subscriber.

FRANCIS I. MAULE, 330 Chestnut Street, Philadelphia.

Mention THE IRON AGE.



HAVE YOU A

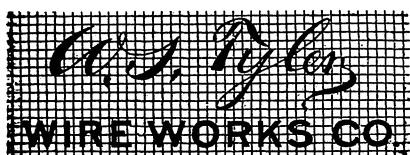
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If not send for

RAPID LATHE WORK.

JONES & LAMSON MACHINE CO.,

SPRINGFIELD, VT., U. S. A.



MANUFACTURERS OF

"The Tyler"
Galvanized Poultry Netting.

All Widths and Meshes Carried in Stock,
W. S. TYLER, Pres. PROCTOR PATTERSON, Sec. and
Treas.
CLEVELAND, OHIO.

LABORATORIES OF
DR. GIDEON E. MOORE,
221 Pearl St., New York.

DEPARTMENT OF CHEMISTRY. Analyses and Assays of Ores, Metals, Waters, Fuel, Oils and Natural and Industrial Products of every description.

DEPARTMENT OF PHYSICAL TESTS. Chas. F. McKenna, Director. Tensile, Transverse and Compression Tests of Iron, Steel and other Metals and Alloys, Cements, Building Stones and Engineering Materials generally. Tests of Lubricating Value of Oils, etc., etc.

PRINTED PRICE-LISTS ON APPLICATION.

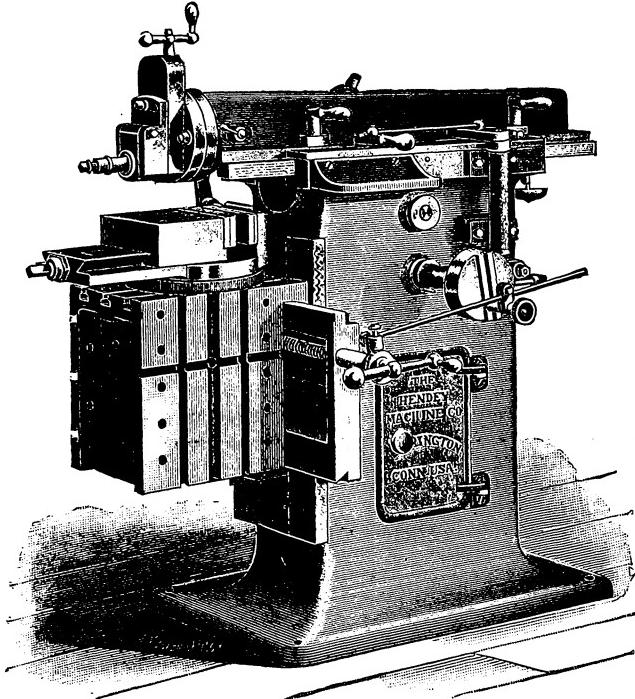
ALUMINUM.

The Pittsburgh Reduction Co.,

701 Ferguson Block, Pittsburgh, Pa.,

Offer Aluminum guaranteed equal in purity to the best in the market, at lowest rates obtainable.

ALUMINUM SHEET, WIRE,
AND CASTINGS.



24-inch Improved Hendey Shaper.

COMBINES the LATEST and BEST Improvements.

Useful Attachments, Strong and Powerful. Changes Made Rapidly. Uniform Cutting Speed. For Tool Room use or all around Machine Shop Work.

THE HENDEY-NORTON LATHE.

It stands at the head. It has no rival.
It represents modern ideas and modern practice in Screw Cutting Engine Lathes.
We challenge a comparison of its conveniences, Useful attachments and every day merits with ANY lathe made.
Buy the best. Keep up with the times.
Send for Circulars.

The Hendey Machine Co., Torrington, Conn.

EUROPEAN AGENTS:
SCHUCHARDT & SCHUTTE, Berlin.
CHAS. CHURCHILL & Co., London.
EUGEN SOLLER, Basel, Switzerland.

Do You BORE CYLINDERS?

THE HORIZONTAL BORING MACHINE

Is a SPECIAL TOOL FOR THIS PURPOSE.

SEND FOR PARTICULARS TO

NEWARK MACHINE TOOL WORKS
NEWARK, N. J.

J. A. FAY & Co., CHICAGO, WESTERN AGENTS.

In the first place—
RIDE A BICYCLE.

In the second place—
RIDE A STEARNS.

E. C. STEARNS & CO.,
SYRACUSE, N. Y.

Metal Worker Pattern Book.

A Practical Treatise on the Art and Science of Pattern Cutting as Applied to Sheet Metal Work. Seventh edition. Illustrated with 520 line engravings. 242 pages, 12½ x 10 inches. Printed on heavy paper. Substantially bound in cloth.....\$5.00

ITS PRINCIPAL CONTENTS are as follows : 1. Definitions and Technicalities. 2. Drawing Tools and Materials. 3. Geometrical Problems. 4. Art and Science of Pattern Cutting. 5. Pattern Problems. Each demonstration is complete in itself. The list of problems embraces almost everything of common occurrence in the sheet-metal trades. The tinner will find in this book what he requires without the necessity of studying the cornice problems. The cornice maker will find everything—from a simple miter to the most complex problems—so arranged as to meet his requirements without having to go over portions in which he is not interested. The apprentice and student will find the entire subject presented in such a manner as will facilitate systematic study. A carefully prepared index accompanies the work.

Sent, post-paid, on receipt of price by DAVID WILLIAMS,
Publisher and Bookseller, 96-102 Reade Street, New York.

WHITE MOUNTAIN FREEZERS.
THE BEST FREEZER.
Heavy Waterproof Tubs. Cans of Charcoal Tin-plate. Malleable Iron Dashers. All inside parts tin-plated. Gearing completely covered.
Inquire of any leading Jobber or write us.
The White Mountain Freezer Co., Nashua, N. H.



The true test of a Freezer is how well it performs its work; in this respect the unsolicited testimony of thousands pronounce the "Packer Freezers" unexcelled.

GOOD LUCK, STANDARD, AND CONFECTIONERS' MACHINE FREEZERS.

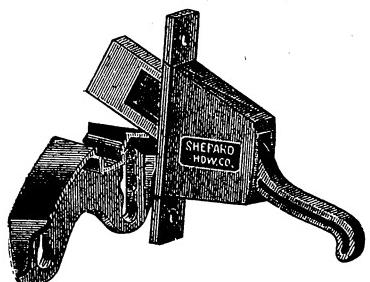
The "Good Luck" is the latest and best low price Freezer on the market. Inside Castings Tinned, Malleable Iron Fittings, Automatic Scraper. White Cedar Pails with Galvanized Steel Hoops. Pine Pails, or Wire Rings with bottom of pail unprotected are not used.

CHAS. W. PACKER, Mfr., 20 N. Fourth St., Philadelphia.

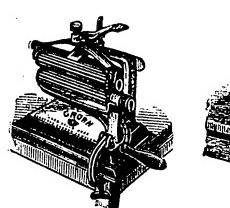
GATE HINGES AND LATCHES, BLIND and SHUTTER HINGES

And FRAME PULLEYS of the
Original "Clark" and other patterns formerly sold by

THE SHEPARD HDW. CO. of Buffalo,
whose business in these lines we have acquired by purchase.



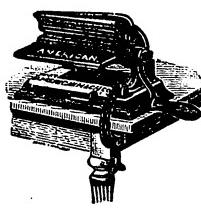
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THE WRIGHTSVILLE HARDWARE CO.,
WRIGHTSVILLE, PA.



Crown.



Original Knox.



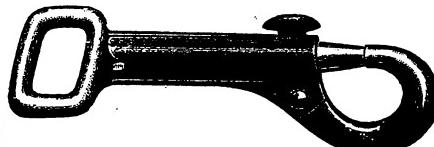
American.

FLUTING MACHINES.

FOR CATALOGUE, PRICE AND DISCOUNTS WRITE TO

North Bros. Mfg. Co., - Philadelphia, Pa.
or JOHN H. GRAHAM & CO., Manufacturers' Agents, 113 Chambers St., New York.

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This snap has many important advantages over other makes of Bolt Snaps, viz.: It is lighter, the spring is entirely covered and protected from foreign substances and freezing, and is lower in price.

Made in all sizes: Round, Loop and Open Eye. We are headquarters and the most extensive manufacturers in Saddlery, Coach and General Hardware specialties.

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FARMER, N. Y., U. S. A.

Hardware Dealers Can Profitably SELL BICYCLES.

There is a large trade in Bicycles in all parts of the country and much of that trade naturally belongs to dealers in hardware. Good bicycles meet with a ready sale and pay a fair percentage of profit.

COLUMBIAS

Are the representative high grade machines in America. A Columbia is the easiest machine to sell to the best trade because it is unquestionably the standard wheel of the world.

We want enterprising agents of good standing and solicit correspondence.

Pope Mfg. Co.,
221 Columbus Ave.,
Boston, Mass.

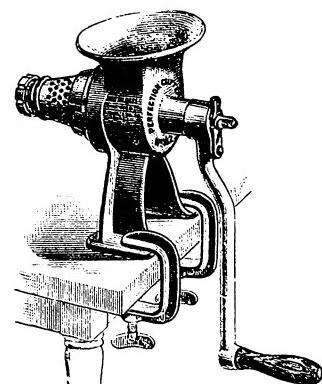
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DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE Circular, stating subject you wish to study, to The Correspondence School of Mechanics, Scranton, Pa.

The NEW
1894
PATTERN
PERFECTION
CUTTER.
Improved and Enlarged.

Simple to use.
Easily cleaned.
Of few pieces.
No parts to wear out.



REID DRILL CHUCKS.

THREE SIZES.



No. 0 takes any drill from 0 to 1-2 inch inclusive.

No. 1 " " " 0 " 3-4 " "

No. 2 " " " 0 " 1 " "

They are the strongest and most durable made. Drill absolutely in the center. No twisting or bending necessary if drill is straight. Can be fitted to hollow spindle lathes for working long rods.

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R. H. BROWN & CO., - New Haven, Conn.

"GREENFIELD" FORGED OX SHOE.

You can no more risk on the quality.
We make only the best!

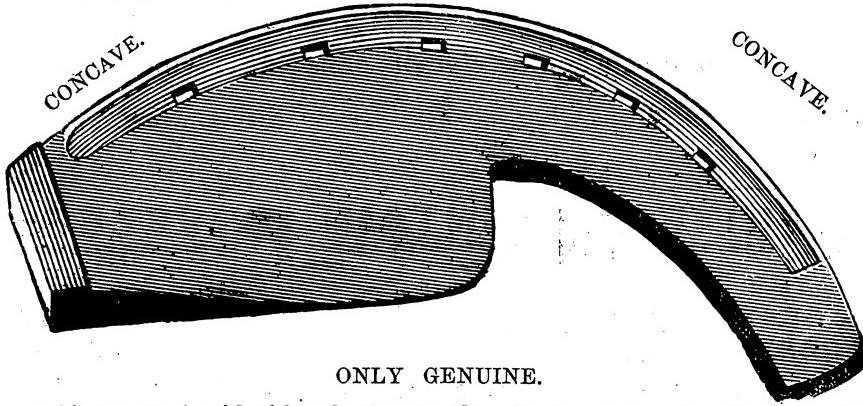


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HAIR FELTING for covering Boilers, Steam and Water Pipe, and lining Refrigerators.

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ONLY GENUINE.

While we can furnish either the Concave Shoe with One Calk, or the Flat Shoe with Two Calks, we emphatically recommend the Concave, with One Calk.

No. 0, Full Length, Concave, 4½ inches, weight per set of eight shoes, 2 pounds.	
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Packed in boxes or kegs of 100 pounds, half each rights and lefts. Full weight, and no charge for packages.

PRICES.

For orders of One Ton or more	9 cents per pound.
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" less than 500 lbs.	10½ " "

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Formerly Forged by Greenfield Tool Company.

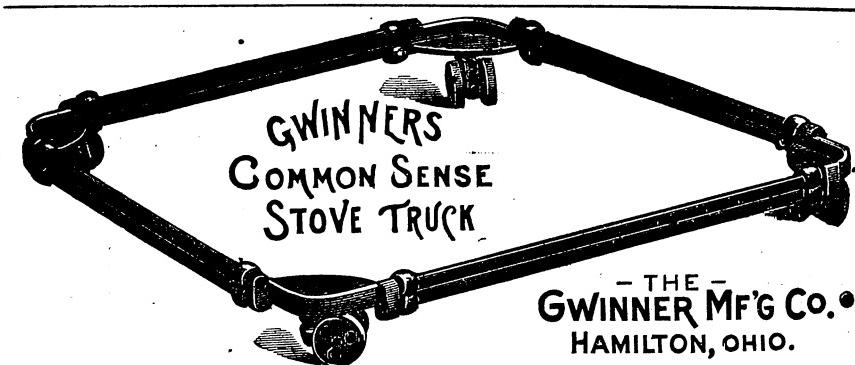
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Single
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Double Blades.

Handle and Blade Formed in one piece.
Always Clean. Indestructible.
No Rivets to Wear Loose.
No Wooden Handle to Shrink, Swell, loosen,
Split, or Fill with Rancid Grease.

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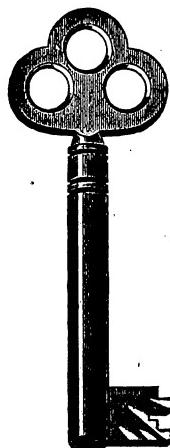


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CABINET LOCKS

OF EVERY KIND.



DRAWER LOCKS,
CUPBOARD LOCKS,
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CHEST LOCKS,
DESK LOCKS.



A complete line of more than 1000 list numbers exclusive of our old
and complete line of

YALE CABINET LOCKS.

THE YALE & TOWNE M'F'G CO.,

STAMFORD, CONNECTICUT.

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The only question is Is it Le Page's?

If it is you have made a sale. HUNDREDS of THOUSANDS of PLEASED and SATISFIED CUSTOMERS testify to the merits of

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If you sell it you do not have to WASTE ANY TIME in answering questions as to its quality.

The people KNOW that LE PAGE'S GLUE is the BEST. They have used it for years and have proved our claims to be true.

It is the only Glue made WITHOUT ACIDS.

A dealer who regards his time as worth anything will not risk losing his CUSTOMERS' CONFIDENCE by trying to sell something which is CLAIMED to be "just as strong" and "just as good as LePage's."

Don't let your customers go to another store for what they want, but SELL THEM WHAT THEY ASK FOR.

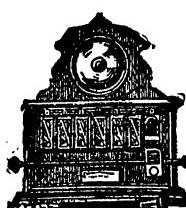
We can furnish original and attractive advertising matter for "LE PAGE'S GLUE" upon request.

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204 FULTON STREET, NEW YORK,

Manufacturers of

SPEAKING TUBES, WHISTLES, ORAL, ELECTRIC
MECHANICAL AND PNEUMATIC ANNUNCIATORS
AND BELLS.

Complete outfitts of Speaking Tubes, Whistles, Electric, Mechanical and Pneumatic Bells. A full line always in stock. Send for new catalogue. Factory, Dekalb Ave. near Knickerbocker, Brooklyn, N. Y.



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Attracts attention and makes customers.
The addition of a highly artistic Embossed Cover creates a good impression at first glance. Our business is to design and make catalogs complete, including engravings.

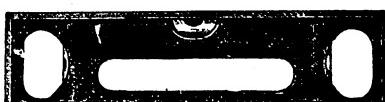
**GRIFFITH,
AXTELL &
CADY CO.**
Holyoke, Mass.
**DESIGNERS PRINTERS
EMBOSSERS**

CARPENTERS' & MACHINISTS'

IRON BENCH LEVEL

WITH DOUBLE PLUMB.

No. 5. 6 in.



MANUFACTURED BY

C. F. RICHARDSON & SON,
ATHOL, MASS.

The Prospector's Field-Book and Guide in the Search for and the Easy Determination of Ores and other Useful Minerals. By Prof. H. S. OSBORN, LL.D. EXTRACT FROM THE PREFACE: In the following pages we have attempted to present such a view of the whole subject of prospecting for the useful minerals that any liberally educated reader may fully comprehend our meaning. We have therefore explained special terms where we have thought it convenient to use them, and where the technically educated student would not need an explanation. The table of contents and index have both been carefully prepared, and being very full, will make reference to any subject in the volume easy and satisfactory. 44 engravings. 175 pages \$1.50

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Branch Warehouses: 85 and 87 John St., New York; 197 Lake Street, Chicago, Ill.

THE OLDEST AND MOST EXTENSIVE MANUFACTURERS OF

Pumps, Hydraulic Rams, Garden Engines,

Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and other Hydraulic Machines in the World.

DOUGLAS' DIAPHRAGM PUMPS, "Loud Patent."

A LARGE CAPACITY AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries;

Fig. 200.

Fig. 281.

Fig. 145.

or wherever it is desired to raise a large quantity of water by
hand power.

The pump has large valves (accessible by hand), and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

CAPACITY

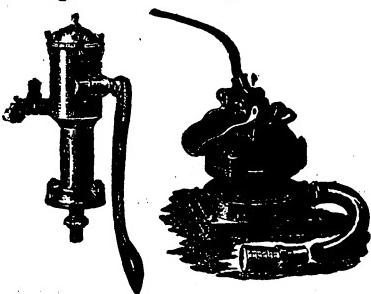
from 3,000 to 4,500 gallons per hour.



C.I. Grindstone Frame.

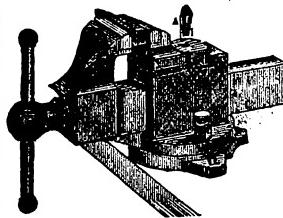
These pumps are simple, durable and low priced.
Made either as shown in cut for Hose or for IRON Pipe Suction underneath.

Send for Circular and Price List.



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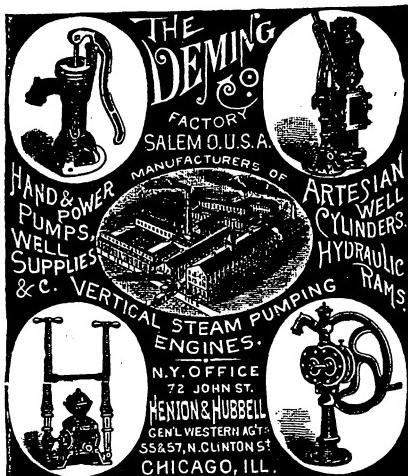
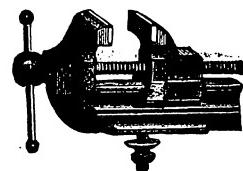
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Send for Illustrated Catalogue
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ALL KINDS OF VISES.

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Ashland Pump and Hay Tool Works

THE MALIN & CO.

34 and 36 Long St., Cleveland, Ohio,

Manufacturers and Dealers in Steel, Copper and Brass
Wire of all kinds.

Patent Spooled Wire

For Retail Hardware Trade and Wire Specialties.

Dealers who handle it do away with the
broken bundle business and sell small quantities
by the spool only. It is a convenience
for both dealer and consumer. It is Shellac
Coated and Cannot Rust: is wound like spool
cotton on 1 oz., $\frac{1}{4}$ lb., $\frac{1}{2}$ lb., 1 lb. and 5 lb.
Spools.

Special Wires Spooled for manufacturing
purposes. Send for Illustrated Catalogue
and prices. Sold by all Hardware Dealers.

BOSTON OFFICE,
JOHN WALES & CO., No. 6 Winthrop Sq.



Retail Stock contains 147 Spools

The New York Safety Dumb Waiter.
"The Manhattan Dumb Waiter."
"The Improved Humphrey Hand Elevator."
Made specially to be sold by Hardware Stores.
Thousands in use. Catalogues on application.

THE STORM MANUFACTURING CO.
NEWARK, NEW JERSEY.
Formerly of Poughkeepsie, New York.

THE ART OF SELLING.

By F. B. GODDARD.

12mo, Flexible Cloth, 50 Cents.

In this book the author lets the reader into the secrets of the accomplished and successful salesman, illustrates his tact and finesse, and tells how he masters men; but beyond this, the work embraces much information which will be instructive and useful to all classes of business men. Besides suggestions to buyers, it contains chapters on "Changes in Business Conditions and Methods," "Salesmen's Compensation," "Retail Merchants and Salesmen," "Saleswomen," "How to Read Character," with a collection of clearly and tersely put important Legal Principles and Decisions Governing Sales. Sent, post-paid, upon receipt of price, by

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MANUFACTURERS OF EXCELSIOR MEASURING TAPES.
SUPERIOR QUALITY, LATEST IMPROVED, GREATEST VARIETY.
STEEL, METALLIC, LINEN, POCKET TAPES.
EXCELSIOR BAND CHAINS FOR SURVEYORS, LAND CHAINS, &c.

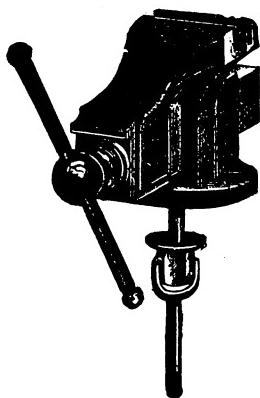
K & E C° FOLDING POCKET RULES.
NO WARPING, NO SHRINKING, NO ILLEGIBLE JOINTS, NO BULK.
2.3.4.5.6.8 FOOT, ALSO WITH PATENT SPRINGS.

FLAT & TRIANGULAR BOXWOOD SCALES, BEST MADE.
PLUMB BOBS, THUMB TACKS, DRAWING INSTRUMENTS.

PRICE LISTS & QUOTATIONS PROMPLY SENT.



Athol Machine Co.,
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HOLLANDS'
OFFSET JAW
VISE.

Specially adapted
for drill press work
where chucks can-
not be used and
equally good for
special or regular
bench work.

Hollands Mfg. Co.,
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Manufacturers all
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Popular Use.

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PRICE, \$1.00. Post-paid.

A simple, clear and accurate presentation
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divorce, &c., &c., with which are included
correct copies of all legal instruments and
forms, such as notes, deeds, mortgages, leases,
wills, &c., and a dictionary of legal word
and phrases.

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DAVID WILLIAMS,

Publisher and Bookseller.

96 - 102 Reade St., New York.

Skilled mechanics prefer them Live dealers sell them

Best in workmanship Finest in finish Latest in improvements

STARRETT'S

FINE TOOLS

Send for Catalogue L. S. Starrett, Athol, Mass.

For all workers in metal or wood Every tool warranted satisfactory

The Taintor Positive Saw Set.

Mechanics are now inquiring for this tool, and Hardware Dealers should have them in stock, or at least have a sample.

For Prices and Discounts, address

WIEBUSCH & HILGER, LTD., SOLE AGENTS,
84 and 86 Chambers Street, NEW YORK.



This saw is always ready for use. Never has to be adjusted after blade is put in. Will last a life-time.

Send for Descriptive Circular and Prices to

Butler Mfg. Co.,
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BOSTON, MASS.

FACTORY, 330 to 338 First Street, So. Boston.

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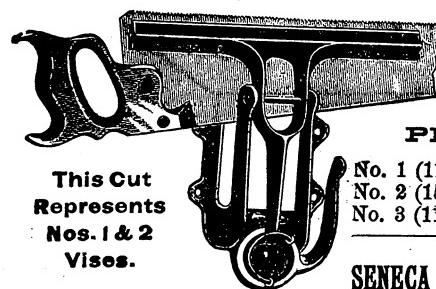
THE NATIONAL SAW CO., OPERATING SAWS

Wheeler, Madden & Clemson Mfg Co., Woodrough & McParlin, Richardson Brothers, Harvey W. Peace Co., Monhagen Steel Works, Woodrough & Clemson, Pennsylvania Saw Co.

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GENERAL OFFICE:
NEWARK, - - New Jersey.

WENTWORTH'S PATENT NOISELESS SAW VISES, WITH RUBBER CUSHIONED JAWS.



This Cut
Represents
Nos. 1 & 2
Vises.

Prevent all vibration and render Saw Filing noiseless.
Will make no more noise than Filing on a Solid Piece of Iron.

Have a Larger Sale than All Other Kinds Combined.

PRICE LIST.

	PER DOZ.
No. 1 (11 inch Jaws),	\$15.00
No. 2 (15 inch Jaws),	21.00
No. 3 (11 inch Jaws),	18.00

LIBERAL DISCOUNT TO THE TRADE.

LONGEST JAWS, HEAVIEST AND
BEST FINISHED.

Sold by all leading jobbers of general Hardware at Factory Prices.

—MANUFACTURED BY—

SENECA FALLS MFG. CO., 255 Water St., Seneca Falls, N. Y.



No. 3 Vise.

E. C. ATKINS & CO., Indianapolis, Ind.

BRANCH HOUSES:
Memphis, Tenn.
Minneapolis, Minn.
Chattanooga, Tenn.

Circular, Band, Cross-Cut and Hand Saws.

Diamond.



Dexter.

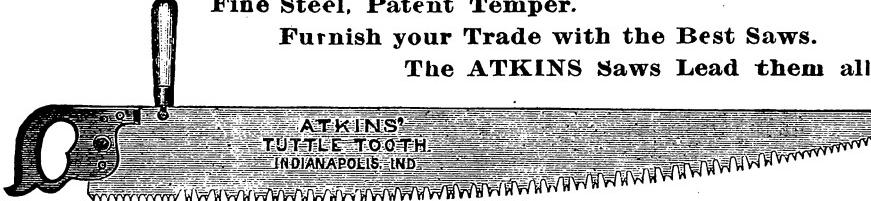
Rex.

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American.

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ATKINS



Fine Steel, Patent Temper.

Furnish your Trade with the Best Saws.

The ATKINS Saws Lead them all.

ATKINS

Write for Price-List and Trade Prices.

ACME CUTTING TOOLS.

Made in all Sizes.

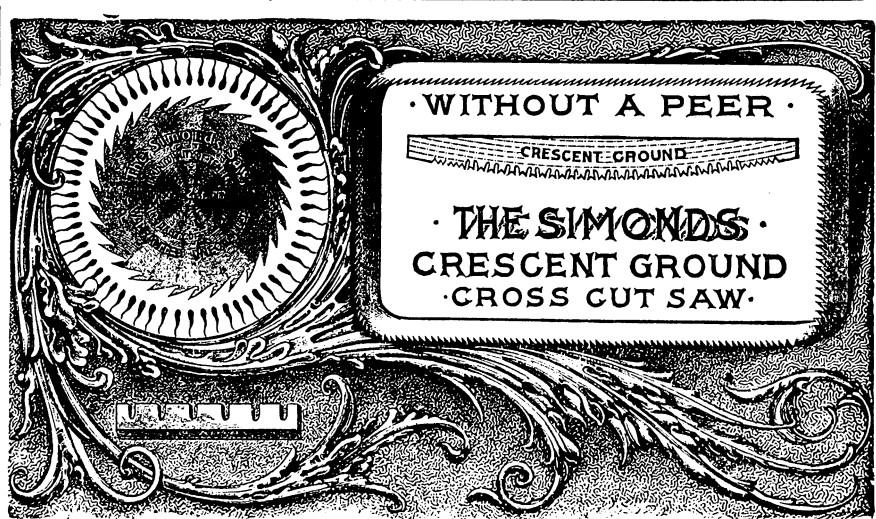


SOLID STEEL ACME PLIER
AND WIRE CUTTER.
Made with cutters of best steel.

ACME CUTTING NIPPER.
Jaws of Chisel edge Tool Steel, dove-tailed into the head, making it as strong as solid steel.

HICCANUM HARDWARE CO., HICCANUM, CONN.
New York Office, 18 Cliff Street.

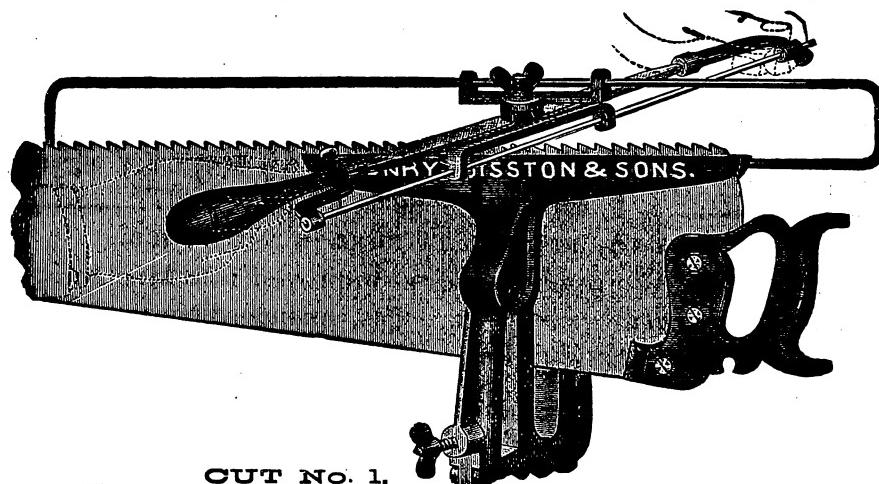
Triple and Quadruple Expansion Engines
and Boilers and their Management. By
A. RITCHIE LEASK. 59 Illustrations, 12mo, cloth
For sale by David Williams, 96-102 Reade St., N. Y.



Simonds Mfg. Co. Simonds Saw Co.,
FITCHBURG, MASS. CHICAGO, ILL. SANFRANCISCO CAL. PORTLAND, ORE.

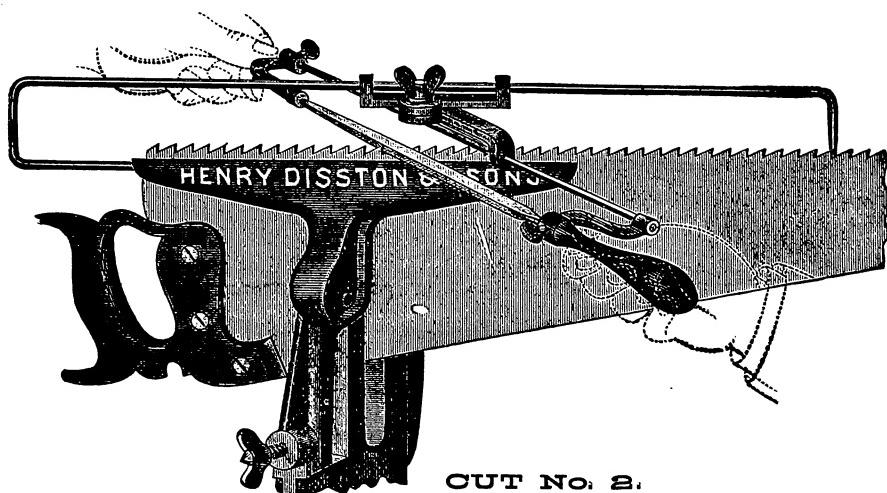
DISSTON'S Improved Saw Clamp AND FILING GUIDE.

ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART OF SAW FILING TO FILE A SAW CORRECTLY.



CUT NO. 1.

Cut No. 1 shows a saw and the attachment in proper position for filing the first side; and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT NO. 2.

To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

This filing guide is sold only attached to our No. 3 Improved Clamp or Vise, and not sold separately. We recommend this as the best saw clamp on the market, being quickly and easily adjusted, and not liable to get out of order.

Write for price including No. 3 Clamp, Filing Guide, File and Handle complete: Packed one in a wooden box.

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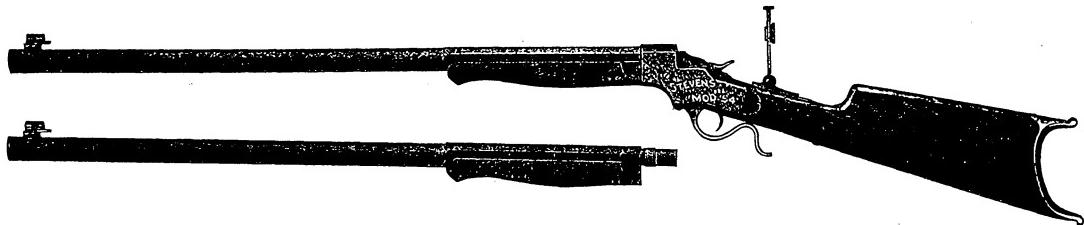
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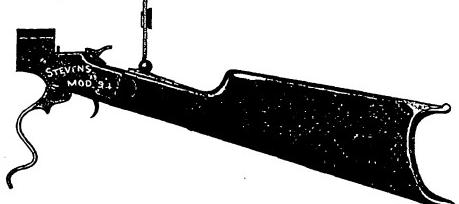
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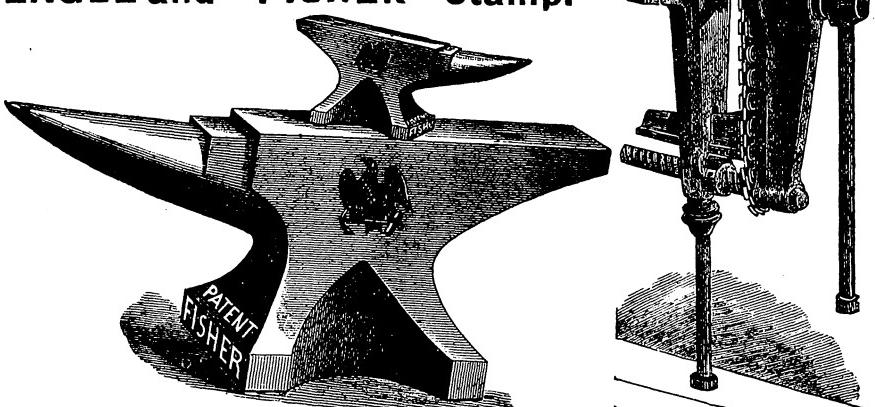
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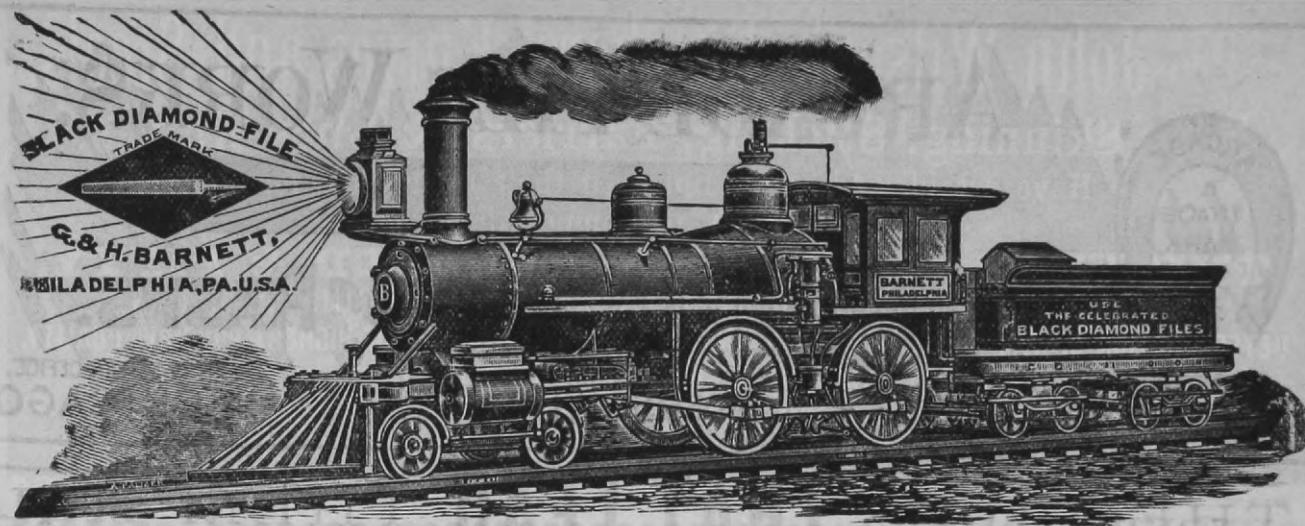
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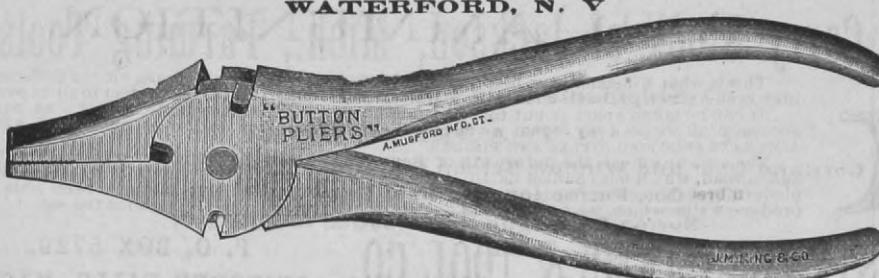
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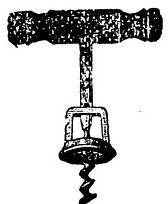
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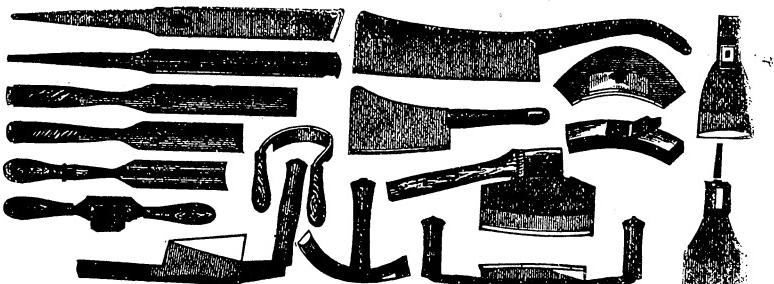
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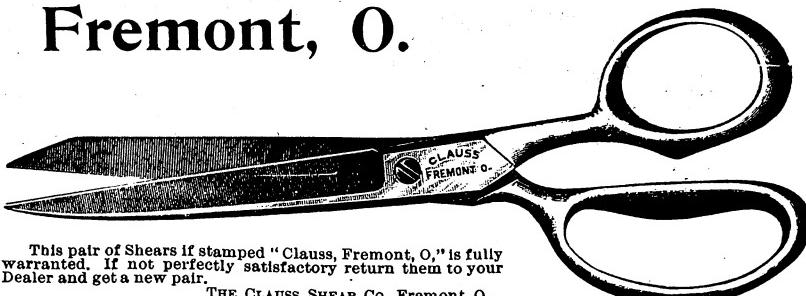


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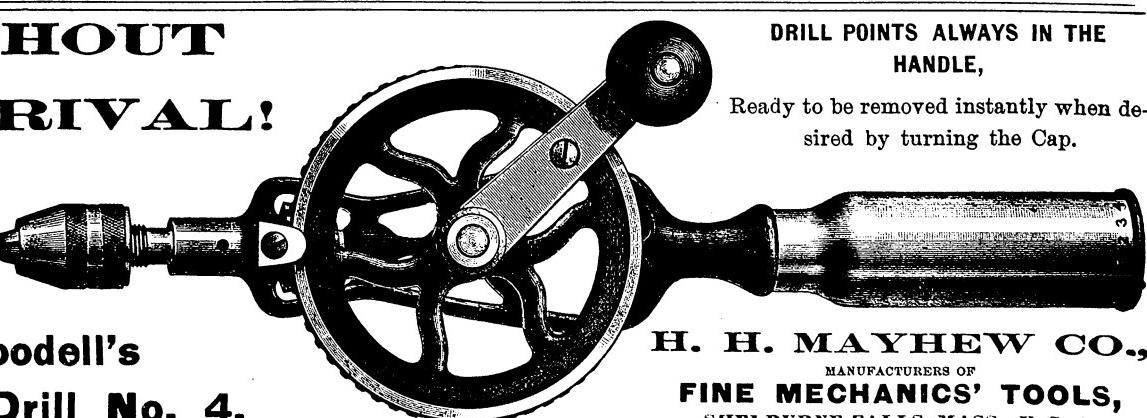
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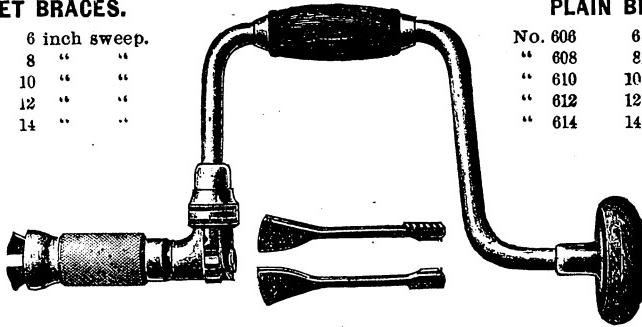
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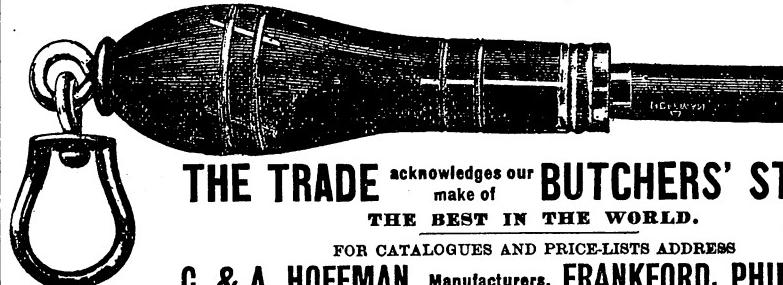
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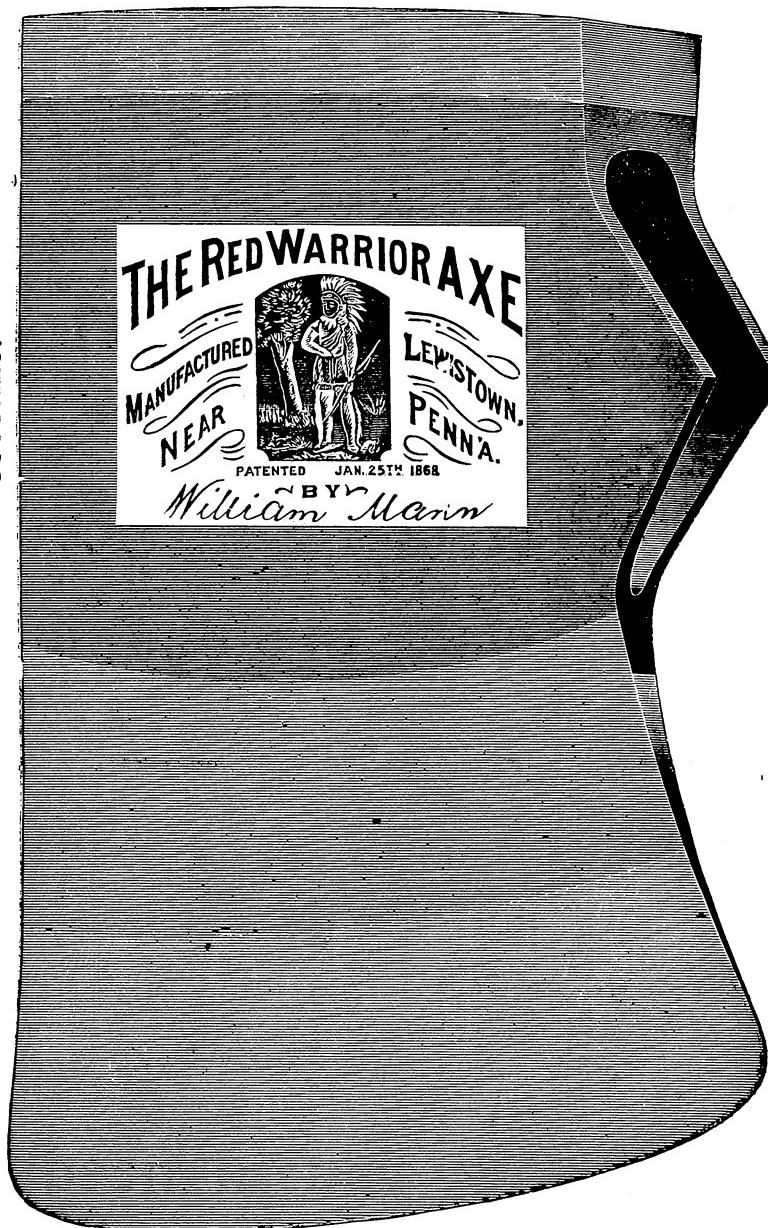
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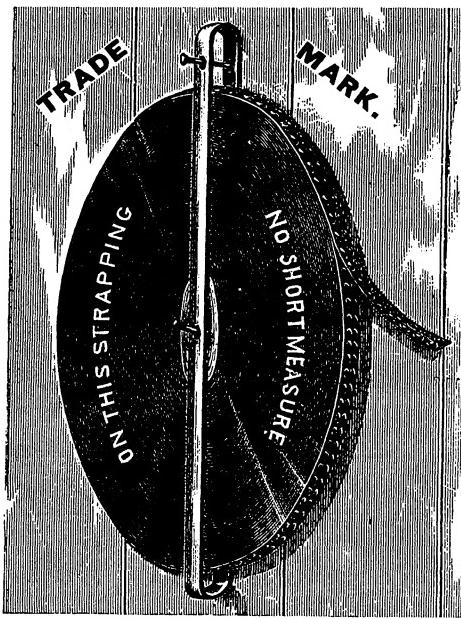
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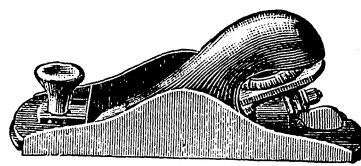
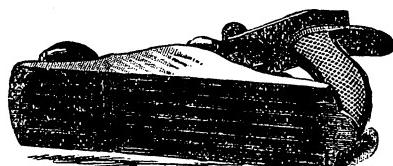
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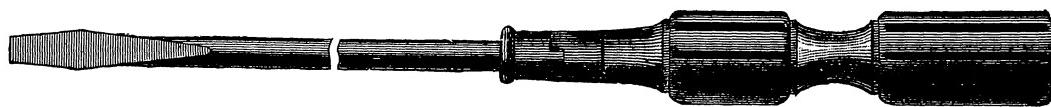
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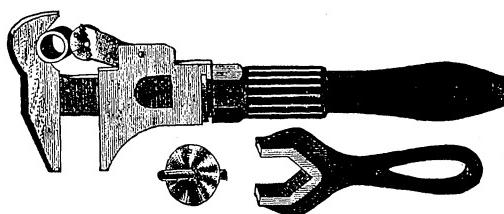


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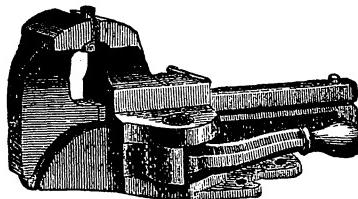


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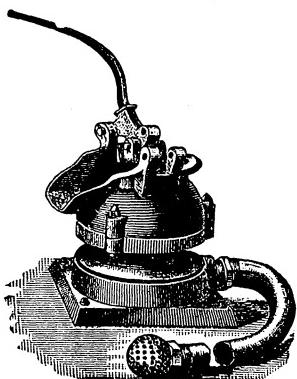
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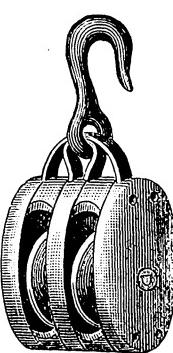
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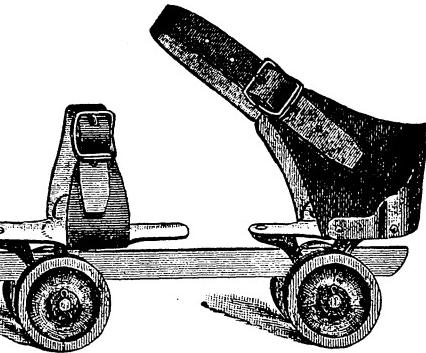
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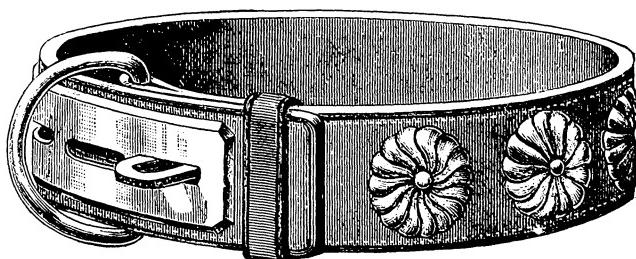
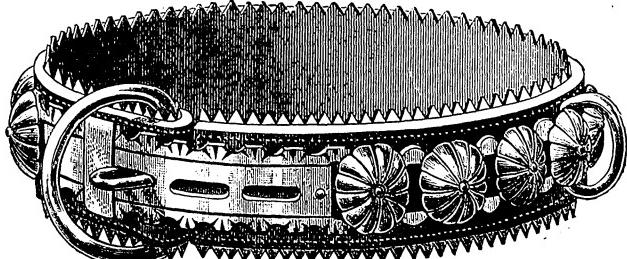


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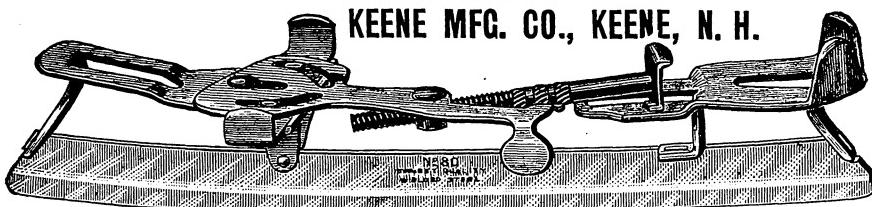
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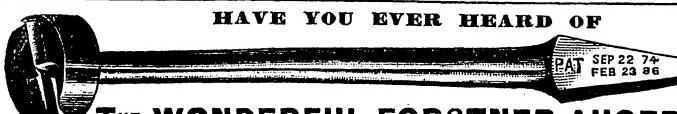
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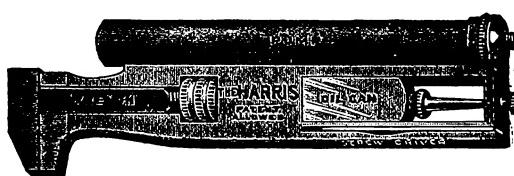
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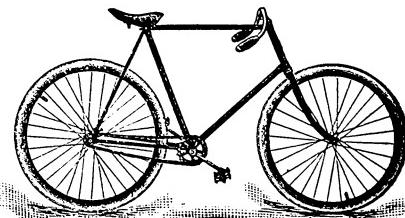
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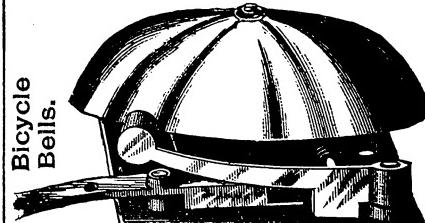
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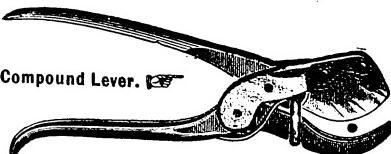
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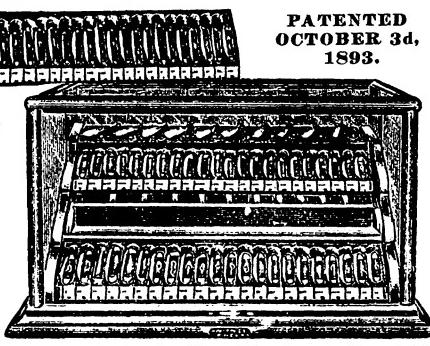
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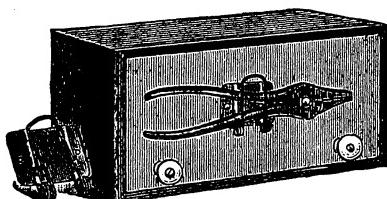
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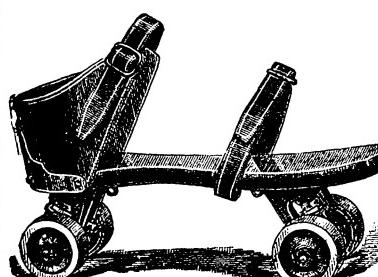
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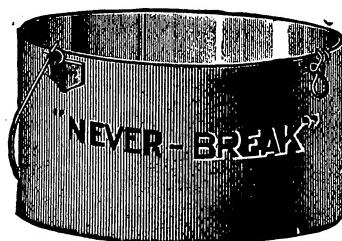
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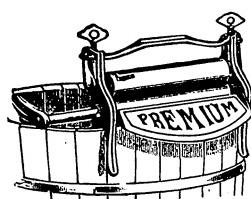
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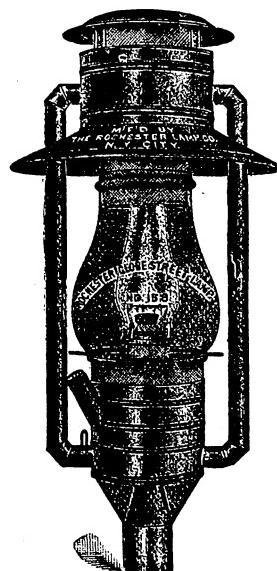


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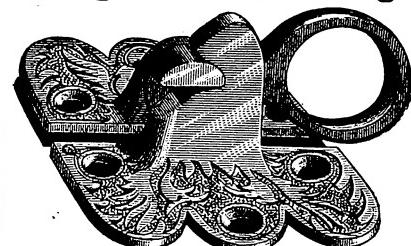
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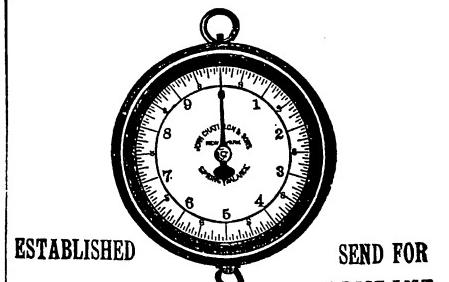
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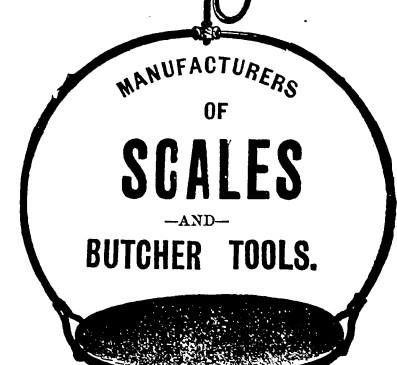
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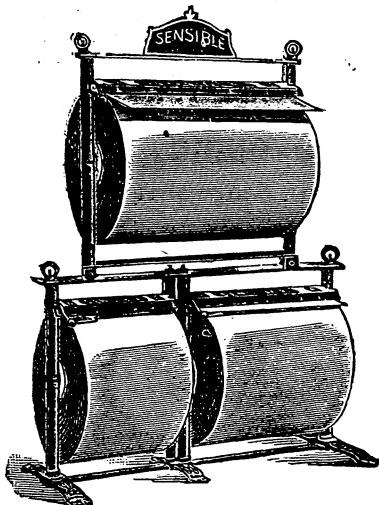
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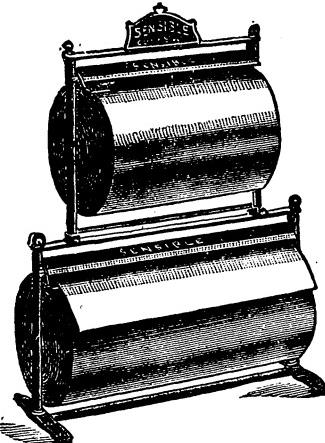
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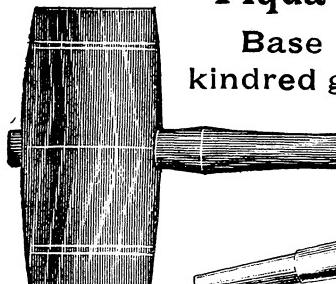
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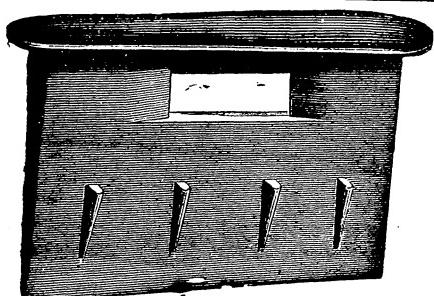
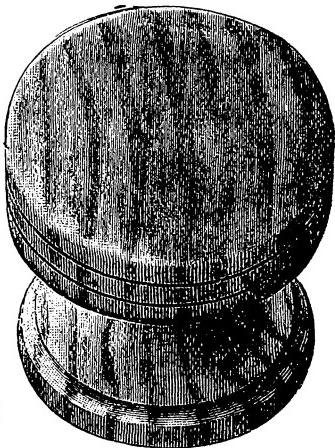
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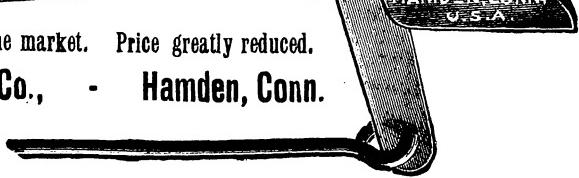
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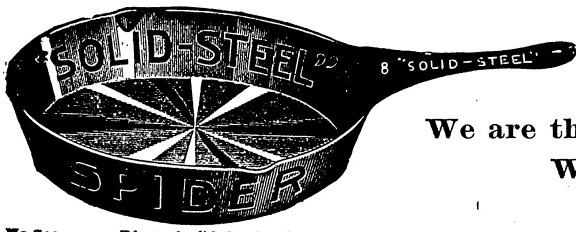


Henry's New Tree Pruner.

Conceded to be the best in the market. Price greatly reduced.
The J. T. Henry Mfg. Co. - Hamden, Conn.

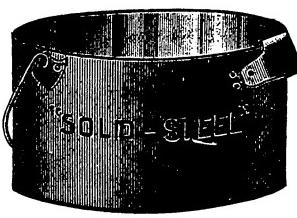


"SOLID-STEEL" SEAMLESS HOLLOW WARE.



No Seams, no Rivets in "Solid-Steel" Ware,

We are the leaders in Steel Hollow Ware and all Sheet Metal Work.



"Solid-Steel" Maslin Kettle.

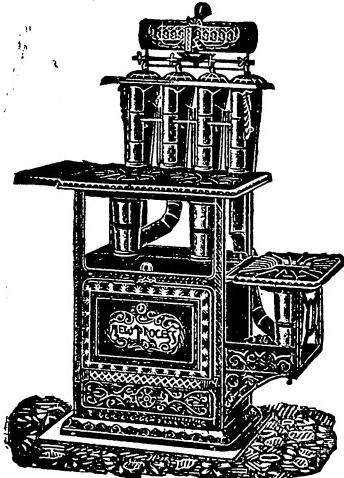
The Cleveland Stamping & Tool Co., Cleveland, O.

We do Light and Heavy Stamping and Blanking. Also build Dies and Stamping Machinery.

Cooking Made Easy!

—BY THE—

"New Process" (Evaporating) Stove

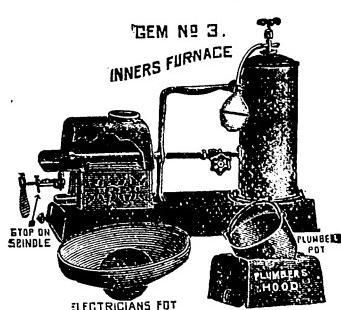


Send for Illustrated Catalogue, giving full particulars to

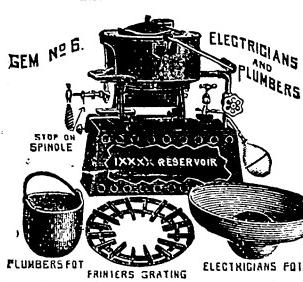
THE STANDARD LIGHTING CO.,

600-620 Perkins Avenue, Cleveland, Ohio.

The GEM GASOLINE Soldering Furnaces.



GEM NO. 3.
INNERS FURNACE



GEM NO. 6.

ELECTRICIANS
AND PLUMBERS

Please Recollect
IF OUR GEM No. 3
and 6 cannot be
worked out of doors
or on roofs in all kinds of weather, that you can bring
them back and your money will be returned. CAN
YOU ASK MORE?

All have cylindered cast iron burner so arranged that
solder cannot clog them.

Ask your Jobbers for them or Write for Prices.

Manufactured by Burgess Soldering Furnace Co., COLUMBUS, OHIO.

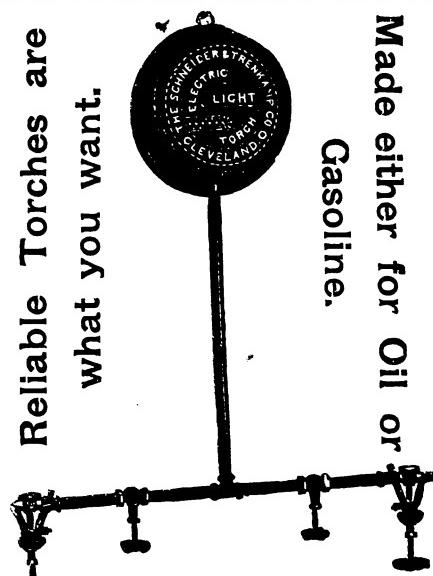


MERRY-GO-ROUND.

Lots of fun. Safer than swings.
Four can ride and operate it. Children
like it. Adults can use it. Strong,
durable, painted, varnished. Re-
quires 12 feet floor or lawn space.
Send for Circular.

W. J. CLARK & CO.,
Salem, Ohio.

Made either for Oil or
Gasoline.
Reliable Torches are
what you want.



These Torches are particularly adapted for use in factories, Foundries, Machine Shops, Rolling Mills, Blacksmith Shops, Warehouses, &c. They make a strong white light, are free from smoke and are not affected by wind or rain. They are convenient and portable. These Torches can be run at an expense of about one-half cent to one cent per hour, burning a bright, steady light which is ten times greater than the light of an ordinary gas burner.

Write us for prices. A liberal discount given to the trade. Manufactured by
THE SCHNEIDER & TRENKAMP CO.
Nos. 479 to 497 Case Ave., Cleveland, Ohio.

THE BOLGIANO MANUFACTURING CO., BALTIMORE, MD.,

MANUFACTURERS OF { Water Motors, Self-heating Sad Irons and Soldering Irons, Combination
Electric Fan Water Motors, Ventilating Fans and Ventilated Bread Boxes.

Send for Illustrated Catalogue with Wholesale Price List.

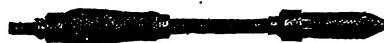


THE BOLGIANO MFG. CO., Baltimore, Md.
Gentlemen:—We received the "Little Giant" Motor No. 2 on April 28, and have tested it in every possible way, and find that it works perfectly. At present it is running an eight and twelve old style Gordon press, and takes it at a very fast rate. We are more than pleased with it, and we will recommend it to everybody as a safe investment for their money.
Yours respectfully,
WOODS BROS.

NO. 3. MOTOR, \$15. For Fans, Printing Presses, Grindstones, | All Sizes of Light Fans for sale.
Coffee Mills, Washing Machines. | Send for Circulars.

\$2.

Bolgiano's New Air Burning Soldering Iron.



(Patent applied for.)

Saves tons of coal. Burns air. Without smell or dirt.



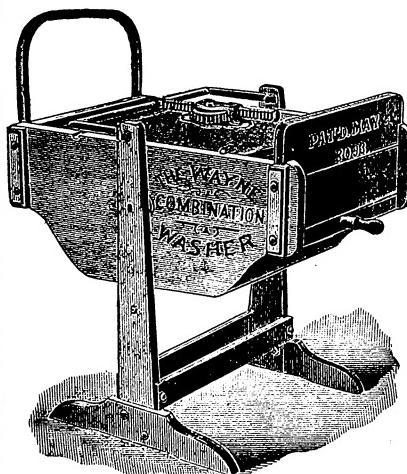
FOR lighting manufacturing establishments, such as Rolling Mills, Foundries, Machine Shops, Engine Rooms, &c., &c., with a convenient, portable, brilliant, steady light, and by cheaper means than by Coal Gas.

SOLE MANUFACTURERS,

The Dangler Stove & Mfg. Co.,
Cleveland, Ohio.

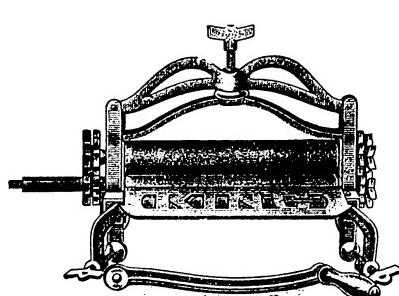


Instead of
Wasting



time over a steamy wash tub, your customers don't have that tired feeling that comes of the hard-working old fashioned way of washing clothes. Don't you think if you were to demonstrate this with a sample machine, you could sell a good many of them and thus make some profit?

Anthony Wayne Mfg. Co.,
FT. WAYNE, IND.



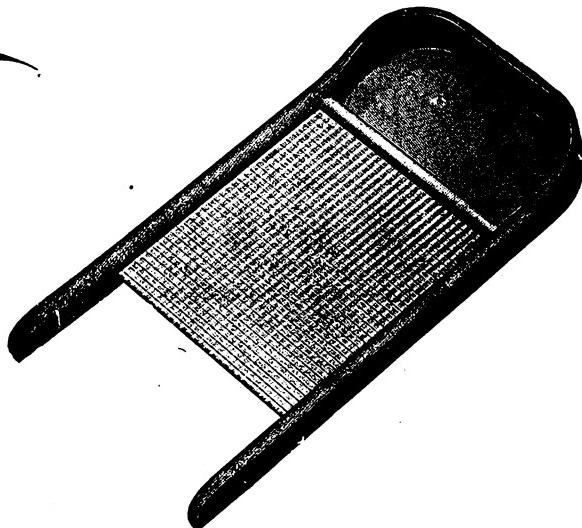
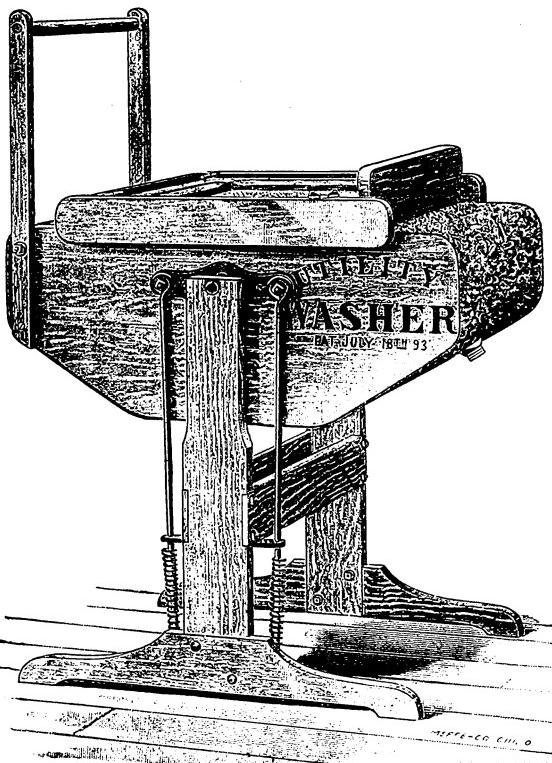
We are Sole Manufacturers of the
Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

Exclusive sale of the ERIE and KING Wringers given to one dealer in each town.

Write for Catalogue.
THE NATIONAL WRINGER CO., CANTON, OHIO.
New York Office, 107 Chambers St., John T. Ryan, Mgr.

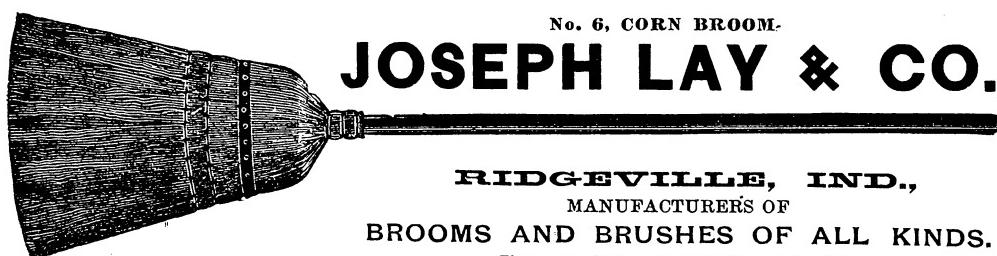
Utility



Washer and Board

Your customers can get along without both, but neither separately. The washer has the peculiarity of washing the clothes **clean** and not wear out either it or the operator. While the board is something entirely new yet thoroughly tested and proven the best made. Write for prices, please.

Olds Wagon Works,
Fort Wayne, Ind., U. S. A.



No. 6, CORN BROOM.
JOSEPH LAY & CO.,

RIDGEVILLE, IND.,
MANUFACTURERS OF
BROOMS AND BRUSHES OF ALL KINDS.
Those of the Heavier Work a Specialty.

FOR
RAILROAD, SHOP,
WAREHOUSE,
STREET, STABLE,
BLOOM,
CHILL, CASTING
and MOULDERS'
BRUSHES, &c., &c.



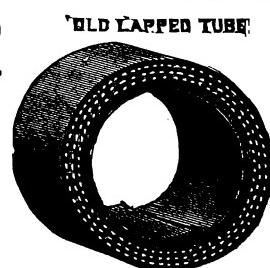
Who Has Not Had Bad Hose ?

Who has not lost time, patience, money, by attempting settlement for such goods?

THE CAUSE in nine cases out of ten is the lapped seam.
THE REMEDY is in buying our

PATENT SEAMLESS TUBE HOSE,

Made by machinery, the tube run like lead pipe, through a die. There is no lapped tube, no seam, no cracks, no defects; water cannot get through to rot the duck and cause the hose to burst.



SALES OF
Over Two Million Feet
—OF—

GARDEN HOSE
alone during the past year,
distributed throughout
the United States, and not a
single piece complained of,
justifies us in guaranteeing
that it will give absolute
satisfaction.

Made in All Sizes and Kinds of Garden, Engine, Steam, Fire, Brewers', Cotton Hose, &c.
Order a Sample Bale of our Seamless-Tube Hose—Best in the World, costs no more than ordinary lapped-seam hose. The different colors, Red, White, Black, Green and Yellow, make a fine window or sidewalk attraction.

CLEVELAND RUBBER WORKS
of the Mechanical Rubber Co.,
CLEVELAND, O.

Makers of Mechanical Rubber Goods, Clothing, Druggists' Sundries, Specialties, Etc.

We were awarded an order for
25,000 ft. for World's Fair
of our celebrated
Seamless-Tube
COTTON RUBBER-LINED HOSE

We Want Your Trade.
Send for 60-page Catalogue.
Write for Prices and Samples.

A practical means of rapidly reaching absolutely accurate results without the mental wear of computing.

It gives at a glance the net of any sum at a great range of discounts, simple and complex, and it is accurate, rapid and practical. Price, \$8.00; Double Indexed Edition, \$4.00.

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LADD'S DISCOUNT BOOK.

Whenever you see a man stealing ideas from his neighbor you may put him down as you would a heavy pumpkin. Yellow is all right as a color but it looks better in the pumpkin.—Puddinhead's son Will.

WE ARE the originators of a combined Show Case and Money Drawer for which we have applied for patent, and our attorneys assure us that our invention is novel and that we will be allowed clear and broad claims and a valid patent.

We therefore CAUTION all persons to not buy or sell said Combined Show Case and Money Drawer excepting those bearing our name plate. We will prosecute all offenders for infringement and damages soon as our patent is allowed, and thus resent the outrageous attack on our business.

We are also the originators of a certain line of Coffee Mills, Money Drawers and Rat Traps and are selling these goods at "hard pan" prices.

When in the market kindly write us.

WADDEL WOODEN WARE WORKS, — GREENFIELD, OHIO. —

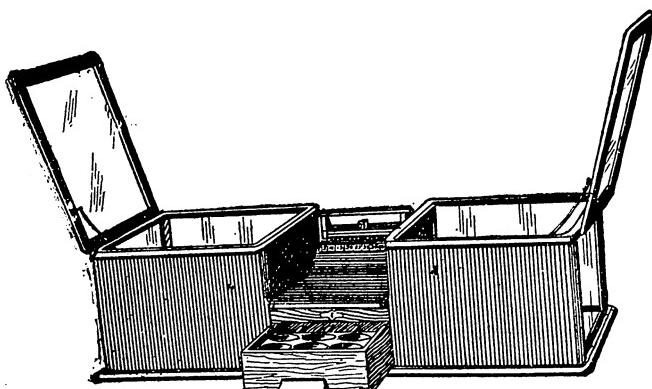
More About Sifters.



If you are not handling the best (there's only one best made, that's the Hunter), we want to make you a proposition that will be satisfactory to you and profitable to both. Will you send us your address and let us submit the proposition? If so, do it at once, please; it's best.

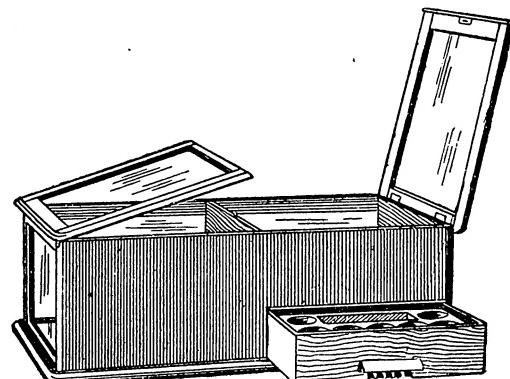
The FRED. J. MEYERS MFG. CO.,
HAMILTON, O.

F. J. MATTISON, Eastern Agent,
69 Beekman St., NEW YORK.



Combined Cash Register and Showcase Cash Drawer with Combination Lock.

PRICE \$25.00, F. O. B. FACTORY.



Combined Showcase and Cash Drawer Combination Lock.

PRICE \$12.00, F. O. B. FACTORY.

Combination Lock on Cash Drawer susceptible of 33 changes; can be set to a different combination in an instant. Automatic Lock on lid of Showcase that is operated by opening or closing Cash Drawer. Case cannot be opened from outside and can only be opened by knowing combination. Alarm Bell is sounded every time drawer is opened.

CASH REGISTER KEEPS RECORD OF ALL SALES AND ADDS IN DETAIL THE FULL AMOUNT.

HUSTLING DEALERS CAN SELL HUNDREDS OF THEM.

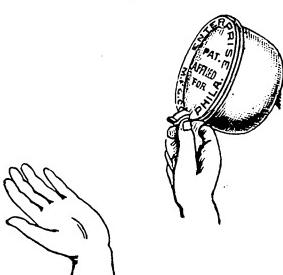
The demand is greater than the supply. Hard times cut no figure. Be quick if you want the cream of the trade.
THE SUN MANUFACTURING CO.,
Greenfield, Ohio,

MANUFACTURERS OF
Cash Registers, Money Drawers, Showcases, Coffee Mills, Specialties
and Novelties.

ENTERPRISE ICE SHREDDERS

For Making Snow Balls, Iced Drinks, &c.

For Sale by the Trade.

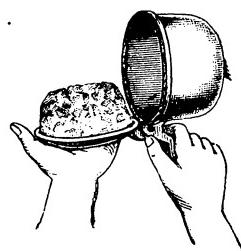


Street vendors are making from three to five dollars per day selling

"SNOW BALLS."



Send for Catalogue,
Free.



Unequaled for
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OYSTERS,
CLAMS,
SLICED
TOMATOES,
ETC.

THE ENTERPRISE M'FG CO. of Pa.,

3d and DAUPHIN STREETS, PHILA., PA.

New York Branch, J. C. McCARTY & CO., 97 Chambers Street.

Low Prices and High Quality.

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Our styles of Corn Poppers
are guaranteed to be all of
the latest and best.

Write to know what
our quantity discounts
are.



Dealers everywhere are entitled to New Catalogue and New Prices.

Bromwell Brush & Wire Goods Co.,
ESTABLISHED 76 YEARS.

Cincinnati, O.

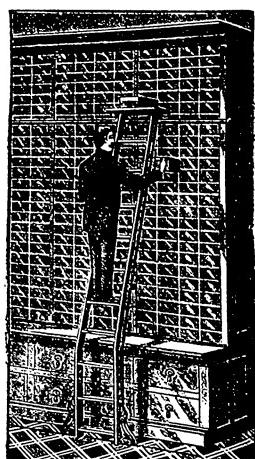
PARKER VISES

HAS STOOD
THE TEST
OF OVER
FIFTY YEARS

The CHAS. PARKER Co.
MERIDEN,
CONN.

THE Bicycle Step Ladder.

Especially adapted for
Hardware Stores.



THE ...
NEWEST,
NEATEST,
SIMPLEST,
EASIEST OPERATED,
and SAFEST
----- STORE LADDER MADE
Highest Award World's Fair.
WRITE US.



The Bicycle Step Ladder Co.,
N. Y. AGENCY:
E. J. HUSSEY & CO.,
80 John St.
50 State St.,
Chicago, Ill.

This is a fac-simile of an 11x15 inch show card in gold and colors which is attractive in every hardware store. We will mail one to any hardware dealer who will place it conspicuously in his store.

NEW DEPARTURE "ROTARY" DOOR BELLS

ELECTRICAL RESULTS.

3 Inch.

No. 91, Nickel Plated.

No. 92, Bronze Plated.

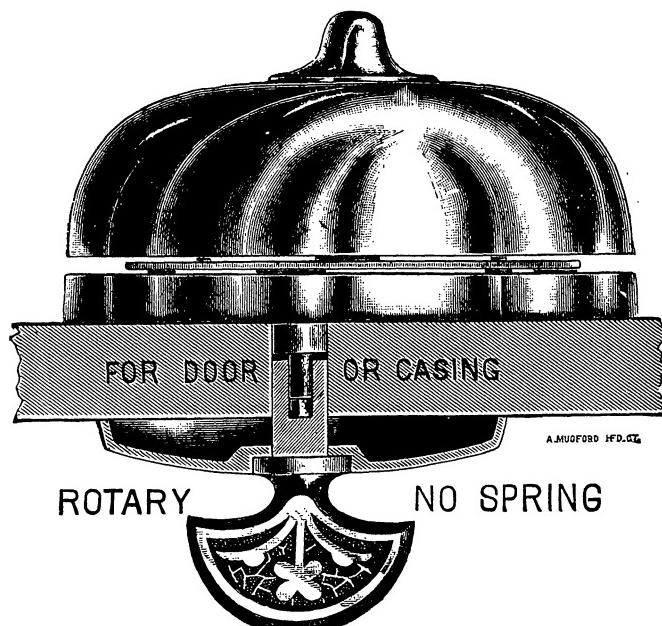
Per Doz., \$17.50.

3 1/2 Inch.

No. 101, Nickel Plated.

No. 102, Bronze Plated.

Per Doz., \$20.00.



Simply turning the knob about one-fourth in either direction produces about ten clear, full tones, which though not startling or annoying, can be better heard all through the house than any bell ever made to imitate Electrical Results.

SOLE AGENTS,

JOHN H. GRAHAM & CO., { 113 Chambers St.,
N. Y. CITY, N. Y.
WRITE FOR PRICES.

ELECTRIC-WELDED
Wire-Hoop Cedar Pail.

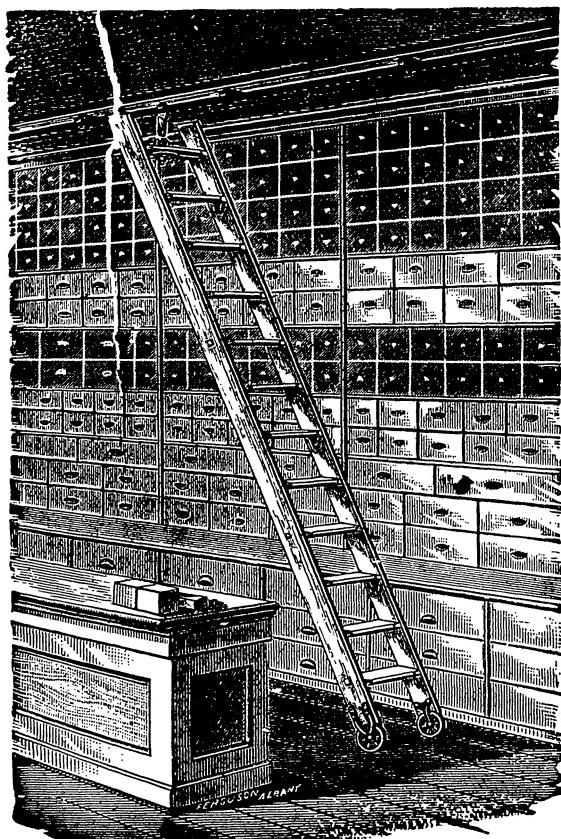


Pat. March 24th, 1891,
and April 10th, 1894.

Made of best selected Virginia White Cedar. Hoops are rust proof, are sunk in grooves, and are twice as strong as old style flat hoop. Impossible for this pail to fall down. Write for prices and catalogue.

Richmond Cedar Works,
Manufacturers of Woodenware,
RICHMOND, VA.

THE "NOISELESS" STORE LADDER.



The latest and best. Perfectly noiseless. Neat in appearance,

Manufactured by

M. CROISSANT,
ALBANY, N. Y.

THE VICTOR DOUBLE TROLLEY STORE LADDER.

WORKS ON A NEW PRINCIPLE.
EASILY.
NOISELESSLY.

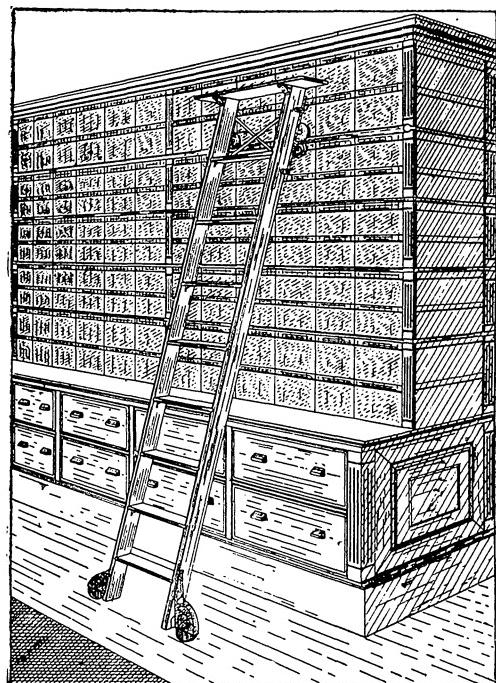
DOUBLE
TROLLEY

HANDY ADJUSTED
TO USE.

COSTS SO LITTLE THAT
EVERY ESTABLISHM'NT
CAN AFFORD TO HAVE IT

All orders are sold subject to thirty days' trial and if not satisfactory may be returned at our expense.

SEND FOR CIRCULAR.



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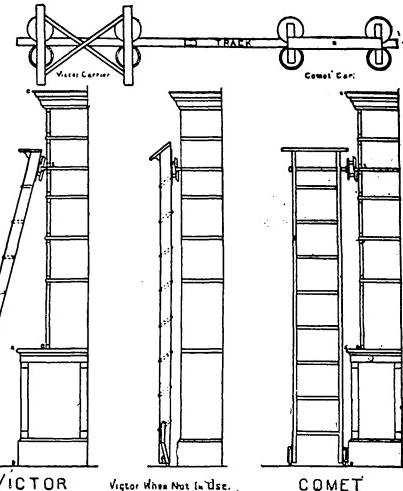
Risk your neck
on a barrel

DON'T

Try to jump
with mouth full of
screws and hands full
of something else.

DON'T

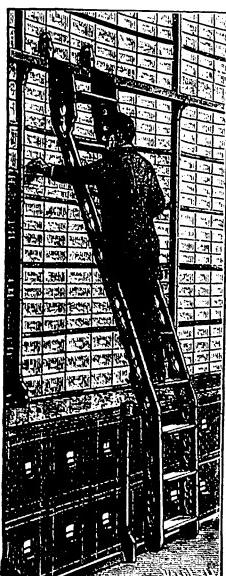
Fail to send for
price of Victor Ladders.



COBURN TROLLEY TRACK MFG. CO., HOLYOKE, MASS. ALSO PARLOR, BARN AND FIRE-DOOR HANGERS.

An Investment

That soon pays for itself, and a fixture you will wonder how you have got along without. Hundreds of recommendations to this effect. This is without doubt the best device of the kind on the market to-day. Steel rail planed to get the smoothest surface. Brackets made to fasten to standards, pilasters, or shelving direct. Can be adjusted to shelving with wide or narrow ledge, and can also be fitted where there is no ledge and can be used on circular rail as well.



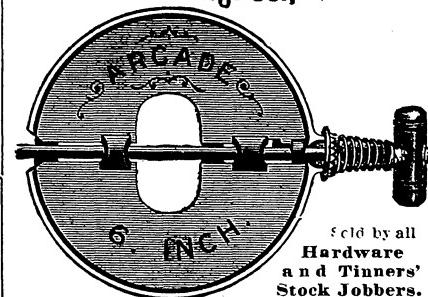
WORLD'S FAIR AWARD.

A postal card will get our Catalogue.

Morley Brothers,

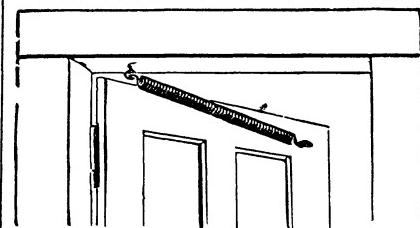
123 N. Washington Ave., Saginaw, Mich.

Made by **Arcade Mfg. Co.,** Freeport, Ill.



Sold by all
Hardware
and Tinnery's
Stock Jobbers.

THE PERFECT DOOR SPRING.



Cheap, Simple, Durable, Effective.

Best Screen Door Spring made. Send for our list of references, comprising some of the first houses in the land. They sell readily, and that is what you are looking for. Drop us a postal.

COILED WIRE BELTING CO.,

40 & 42 Noble St., Jersey City.



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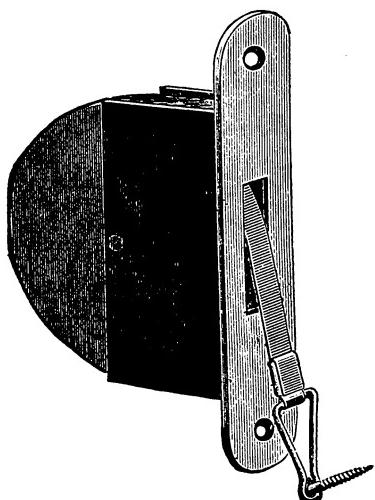
CHURCH PEW AND HOUSE NUMBERS,
Of Bronze Metal, in all Modern Finishes.
RANSON HARDWARE CO., Burlington, Vt.

Once Tried, Always Used.

This demonstrates the fact that the Pullman Steel **FRAME SASH BALANCE** meets the approval of the leading **architects** and **property owners**. So many meritorious points are embodied in this little device, it is really beyond comparison, and should not be compared with light cast iron goods.

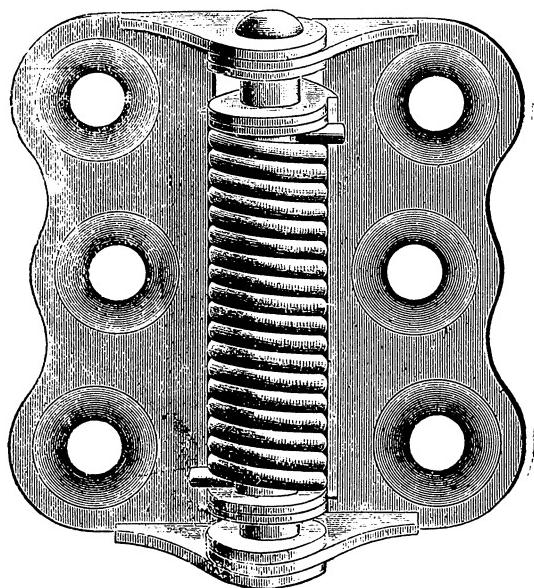
The "Pullman" Balance can be used in connection with old as well as new work. Requires no pockets or boxes. Easily applied and very attractive in appearance.

Every Balance Warranted to Work Perfectly.



**Wrought Steel
Spring Hinges
For Screen Doors.
BOTH REGULAR AND HOLD-BACK.**

We are the only manufacturers who use a loose pin in the joints, thus preventing any binding or sticking and every hinge operates freely.



WRITE FOR PRICES.

Pullman Sash Balance Co., - Rochester, N. Y.

NEW YORK OFFICE:
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ELEMENTS OF COST.

By Frederick W. Child.

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Paper, 25 cents.

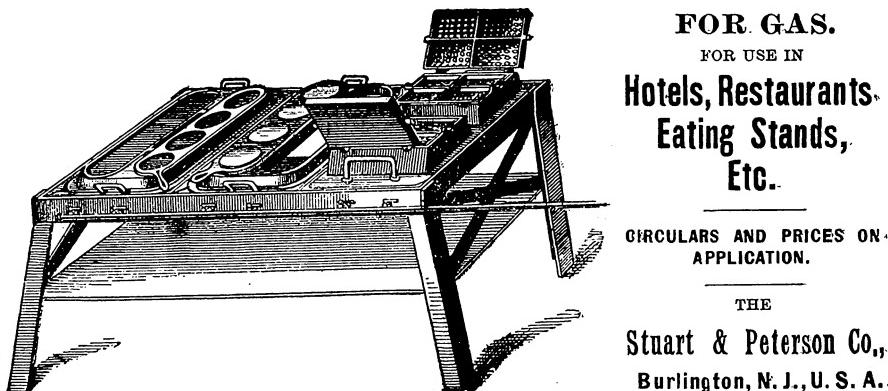
An address to the Institute of Accounts, New York, of which the writer is a member, put in form to assist those in charge of manufacturing accounts. Practical forms are included for a series of order books, examples of foreman's order, form of pay-roll, quarter-time book, job time book, form of summary, charges book, summary of costs, material, labor, cash, expense, manufacturing and improvement acts, store-room, iron foundry, brass foundry.

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NEW S. & P. ACME CAKE GRIDDLES.



CIRCULARS AND PRICES ON APPLICATION.

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Stuart & Peterson Co.,
Burlington, N. J., U. S. A.

Hudson's Garden Hose Mender.

So Simple a Child Can Use It.
Made in three sizes, for $\frac{1}{2}$ in., $\frac{3}{4}$ in. and 1 in. hose.
Put up in Boxes for Family use.

EACH BOX CONTAINS:

1 Pair Plyers,
20 Bands,
6 Tubes.

Sells readily at 75 cents.
Liberal discount to Dealers.
Send for Full Description.



C. E. HUDSON & CO., Manufacturers, Leominster, Mass.

HEADQUARTERS FOR
**TINNERS' HARDWARE &
ROOFERS' SUPPLIES.**

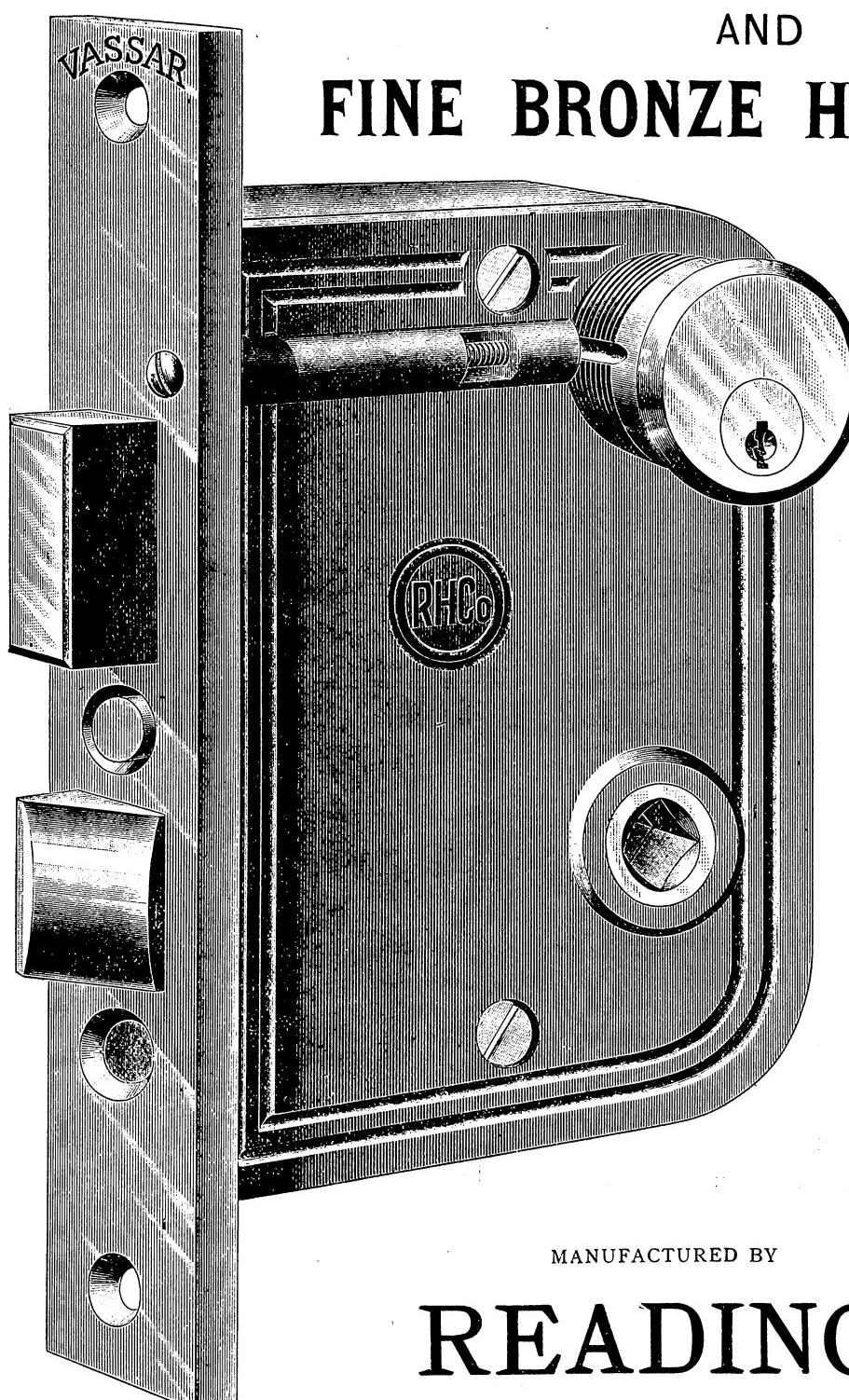
Largest stock, greatest variety. Prices lower than ever. Write us before buying elsewhere.

BERGER BROS., Philadelphia.

"VASSAR" CYLINDER LOCKS

AND

FINE BRONZE HARDWARE.



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PATTERNS

—AND—

NEW

Ornamental
Designs.

“ DUPLEX ”
COLD ROLLED
WROUGHT
BUTTS.

MANUFACTURED BY

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HARDWARE COMPANY,

READING, PA.

NEW YORK,
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TEMPORA MUTANTUR ET NOS MUTAMUR IN ILLIS.

WROUGHT STEEL DOOR LOCKS.

Wrought Steel Cases.

Wrought Steel Fronts.

Wrought Steel Bolts.

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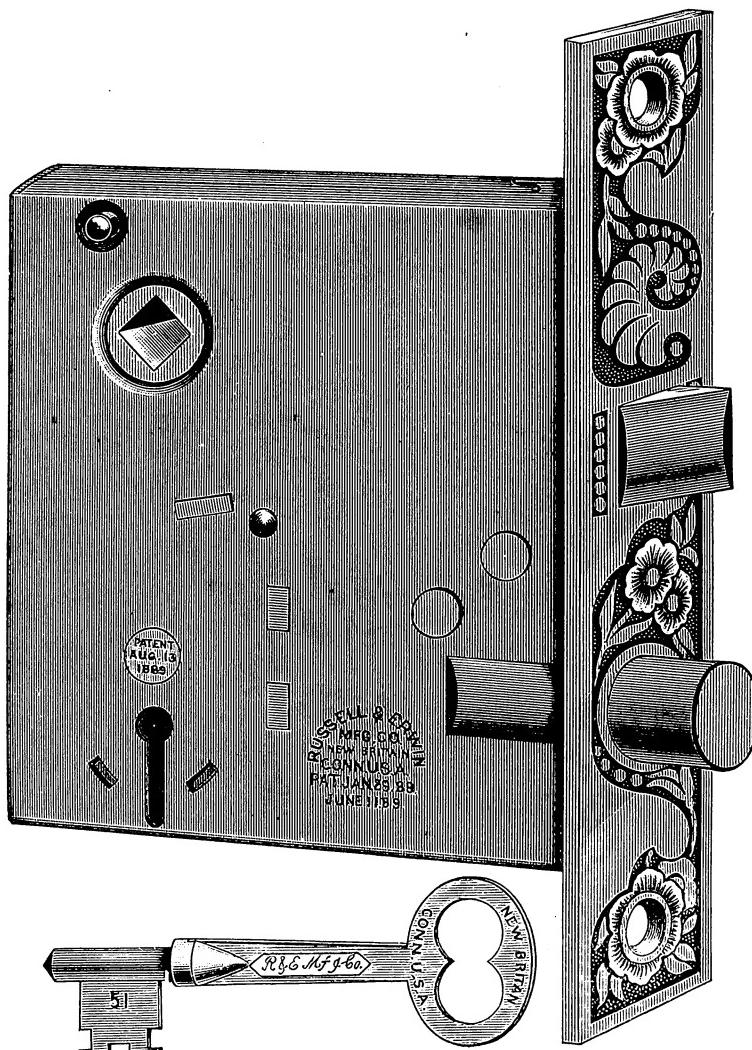
Excel in

Finish,

Lightness

and

Strength.



No. 7726, Bronze Plated, Wrought Steel Front.

Wrought Steel Springs.

Wrought Steel Tumblers.

Wrought Steel Keys.

RUSSELL & ERWIN MANUFACTURING CO.,

Sole Manufacturers,

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NEW YORK.

PHILADELPHIA.

BALTIMORE.

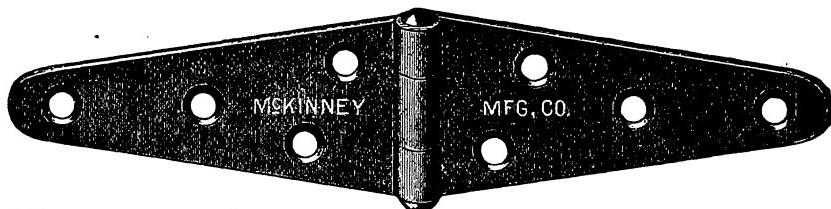
LONDON.

STEEL HINGES AND BUTTS.

STANDARD GOODS.

McKINNEY MFG. CO., - ALLEGHENY, PENN.

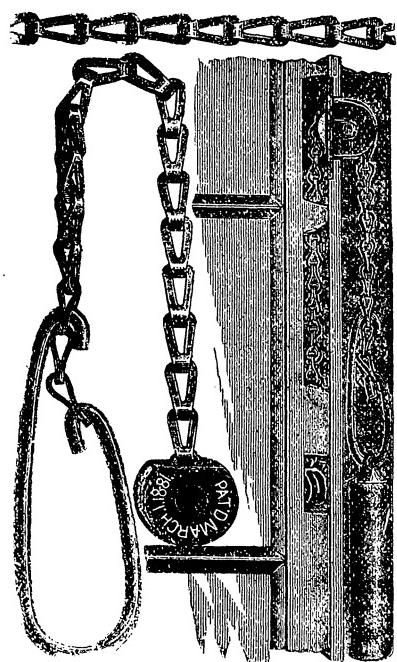
SEND FOR
LIST.



ORDERS FILLED
ON SIGHT.

"NONE BETTER."

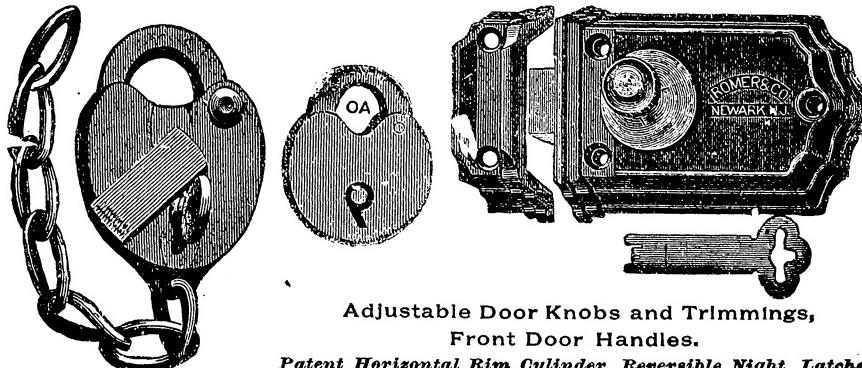
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BRIDGEPORT, CONN.



THE GIANT METAL SASH CHAIN

is a substitute for cord in hanging weights to windows. It is manufactured by us only, and by automatic machinery, patented and owned exclusively by ourselves, and whereby we secure uniformity of construction and quality. We have been to great expense in producing a metal having all the qualities and conditions requisite for making suitable chain for this purpose, and to prevent other chain of the same pattern of link and of the same general appearance, but made from an inferior metal, being offered as the same thing, we patented the word "Giant" as a Trade-Mark, as applied to either metal or chain. Trade-Mark Registered April 16, 1878, and October 22, 1878, and our metal is therefore known in the market as "Giant Metal," and our chain as "Giant Metal Sash Chain."

ROMER & COMPANY, Manufacturers of PATENT
JAIL LOCKS, BRASS and IRON PADLOCKS,



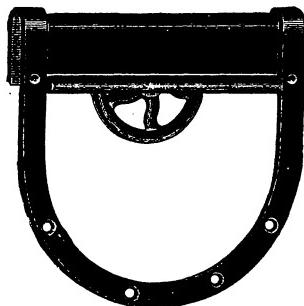
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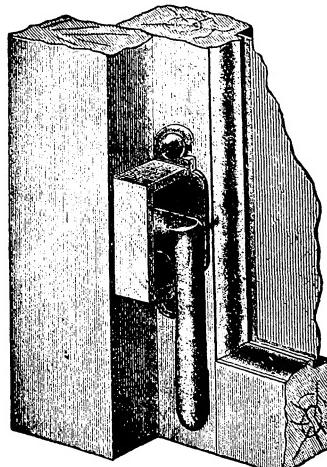
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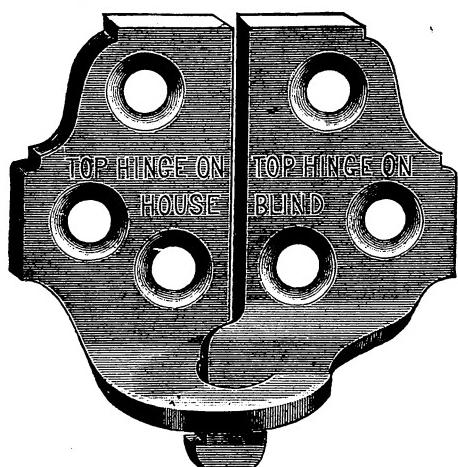
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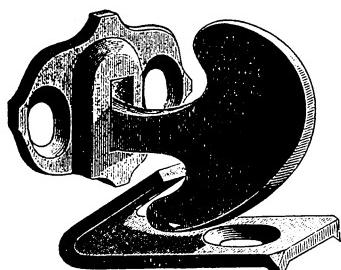
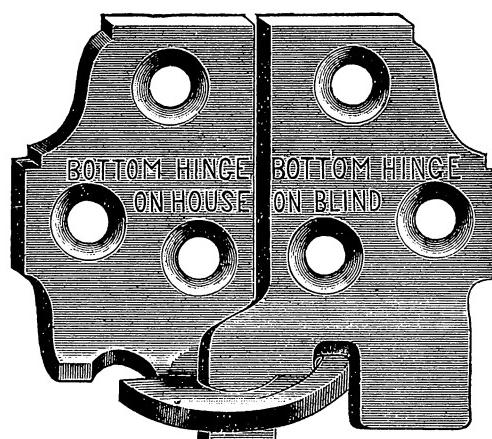
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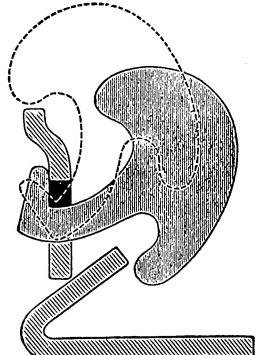


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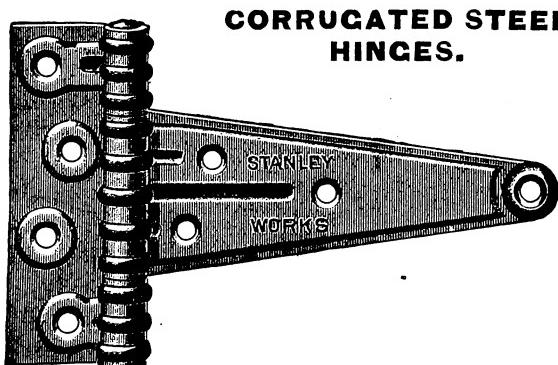
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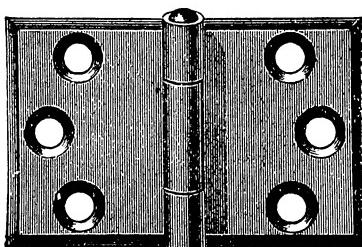
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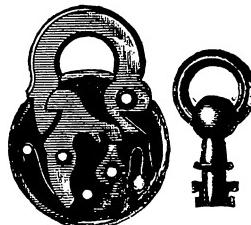
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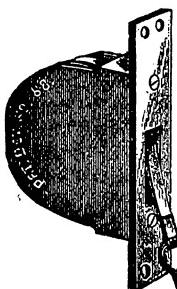
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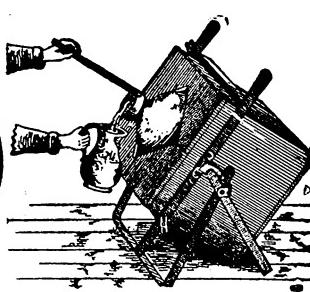
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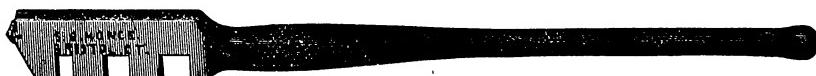
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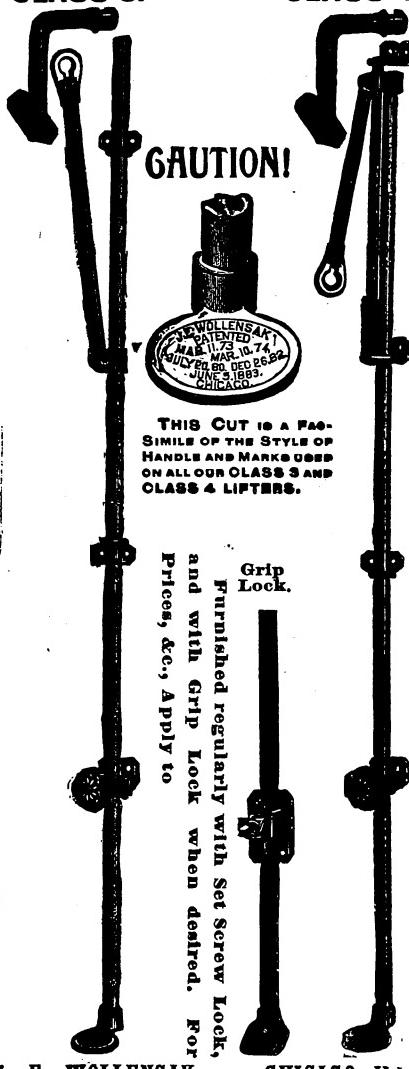
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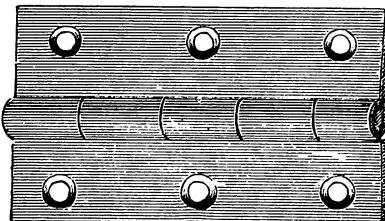
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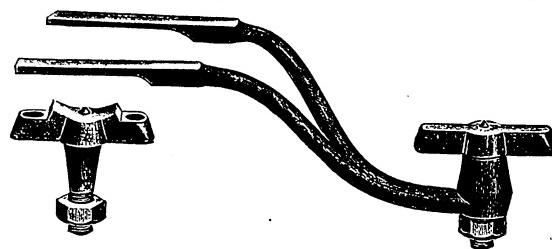
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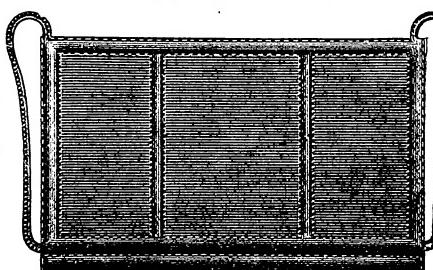
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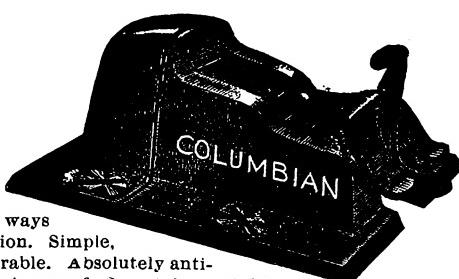
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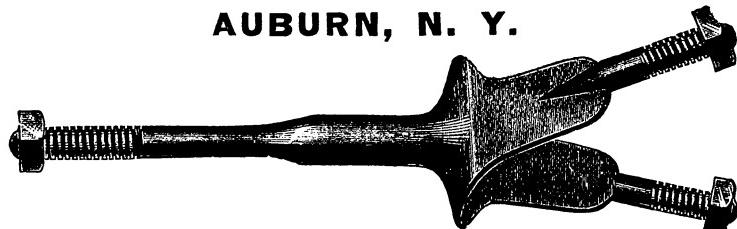
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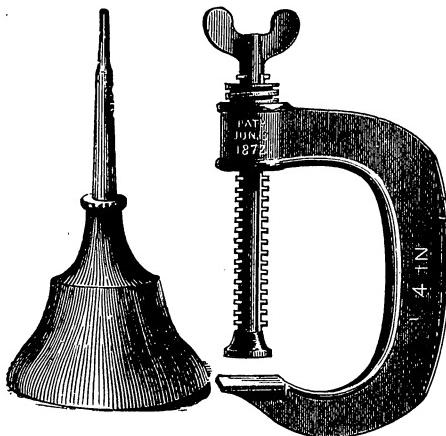
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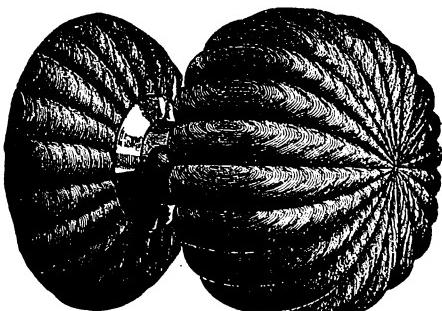
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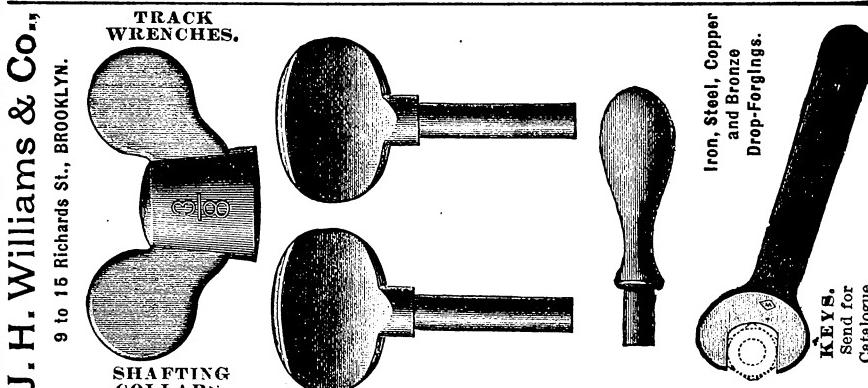
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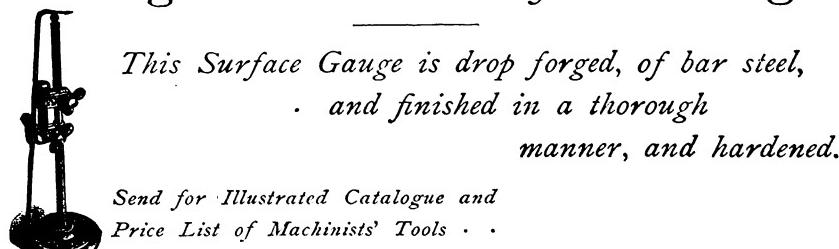


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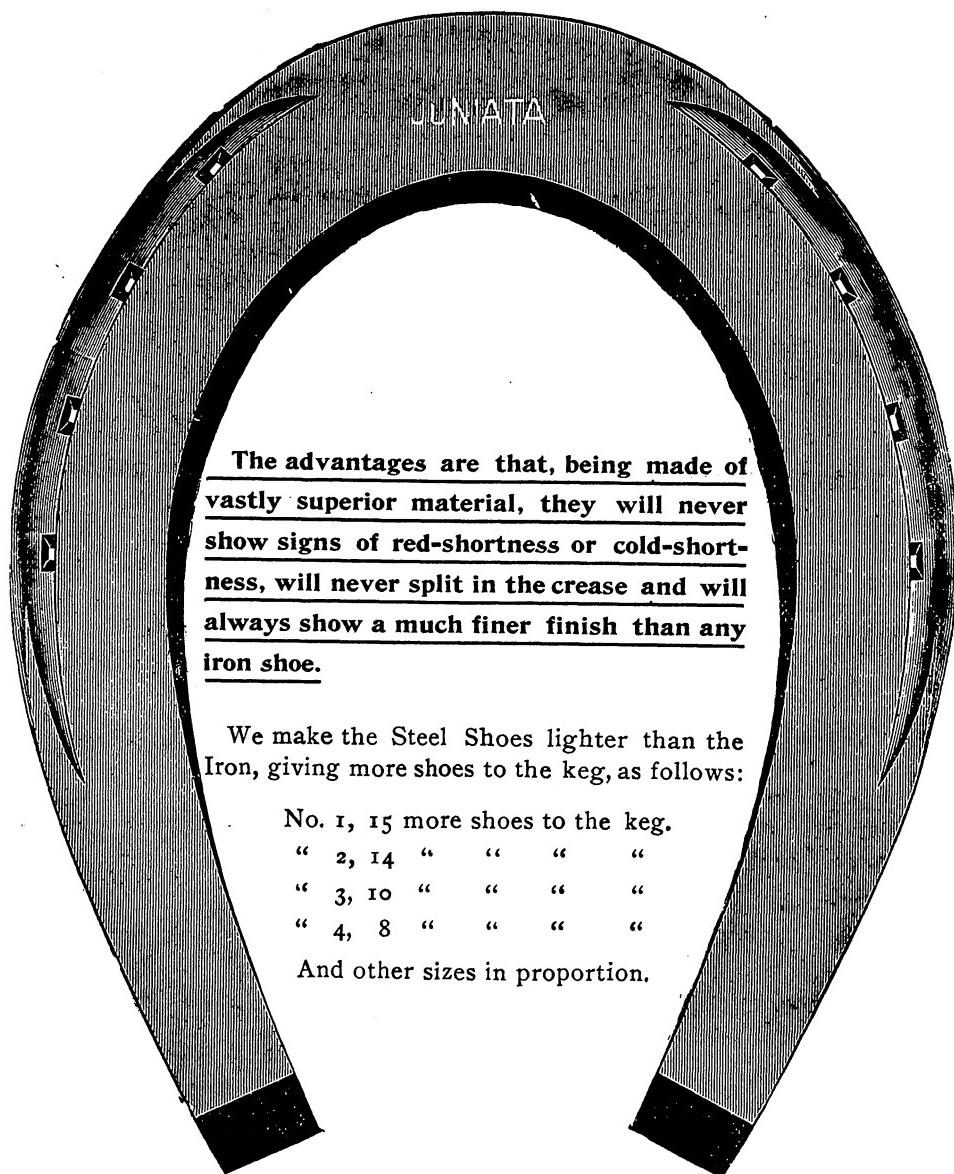
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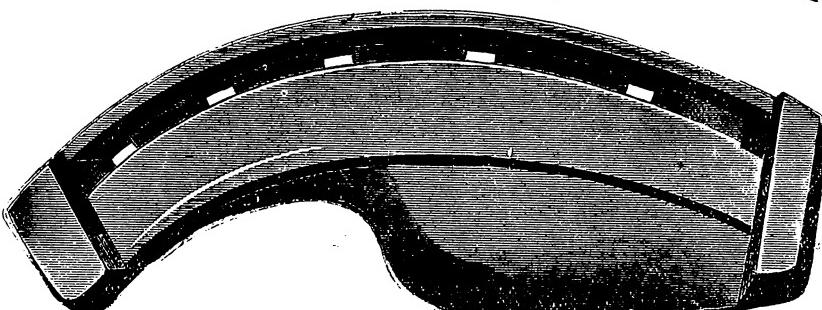
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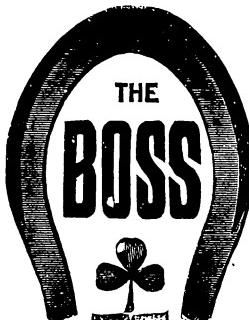
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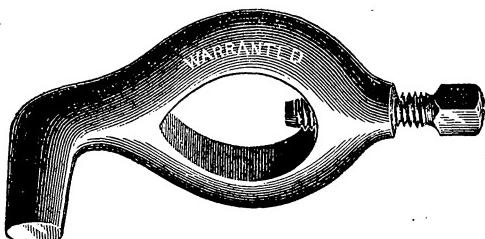
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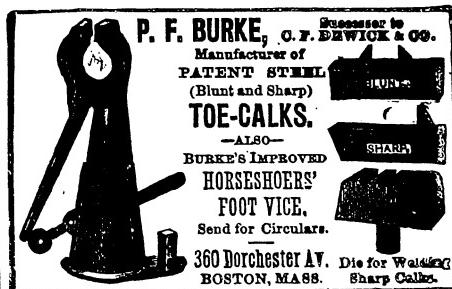
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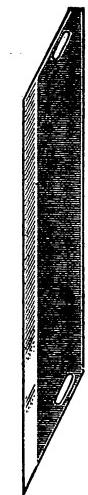
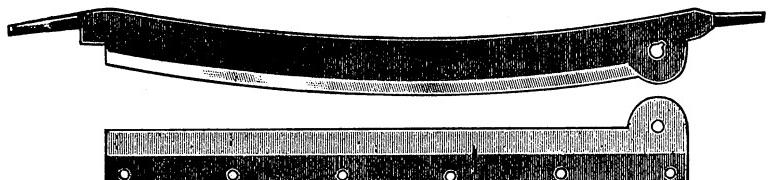
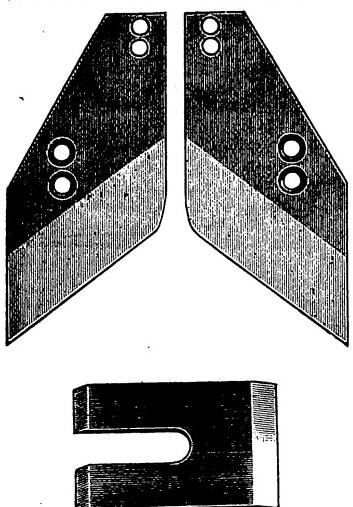
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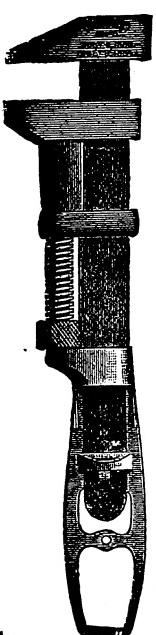
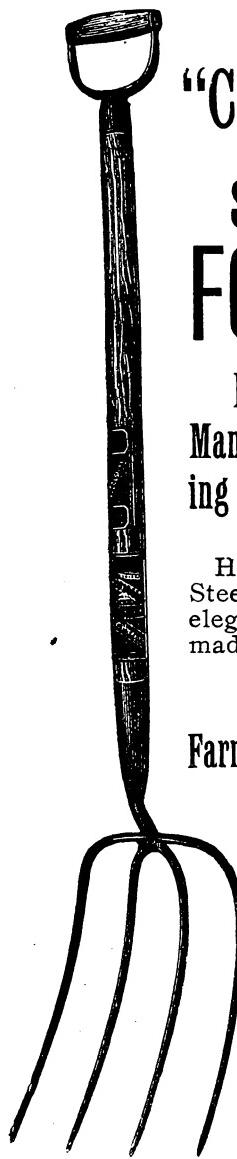
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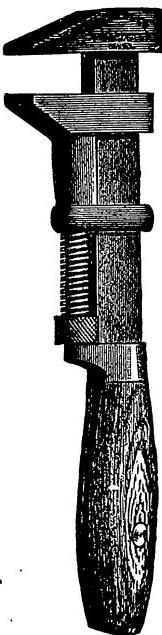
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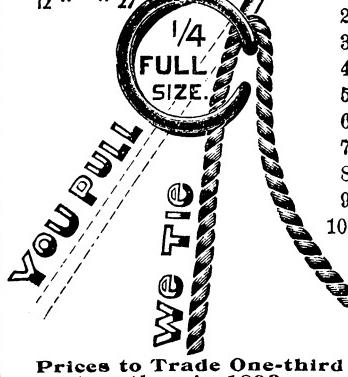
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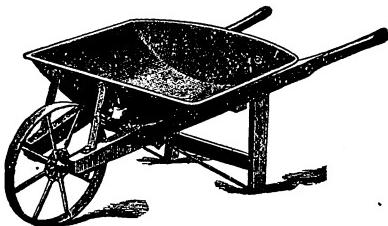
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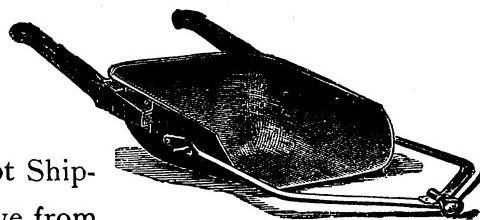
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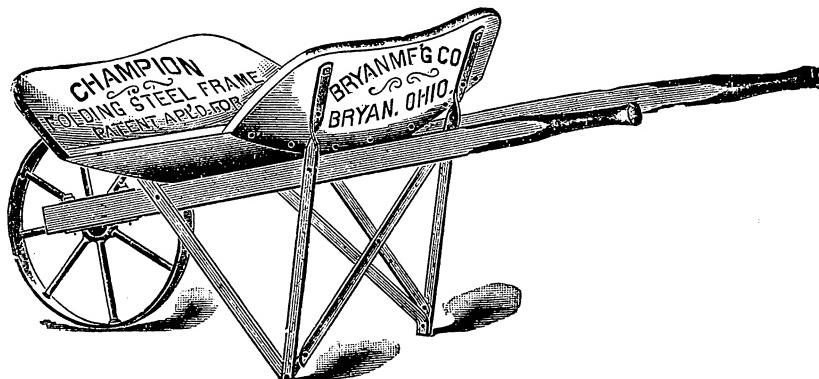
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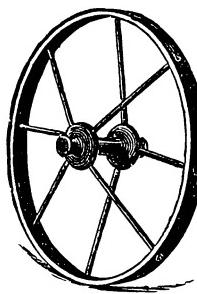
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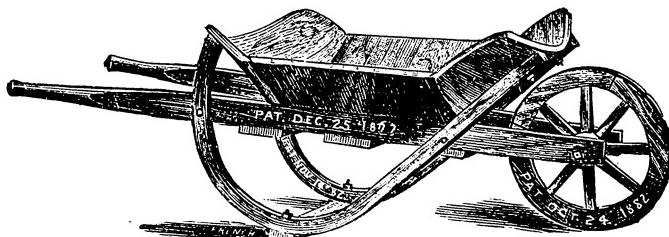


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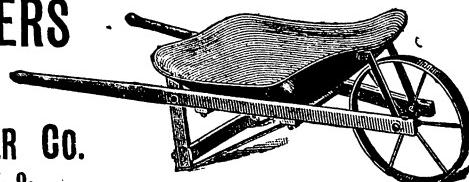
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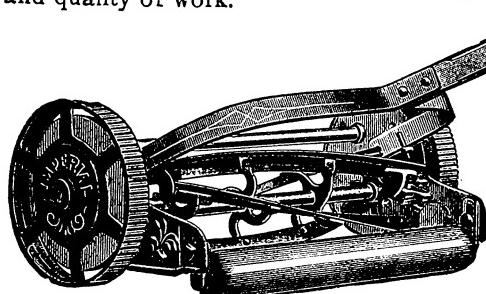


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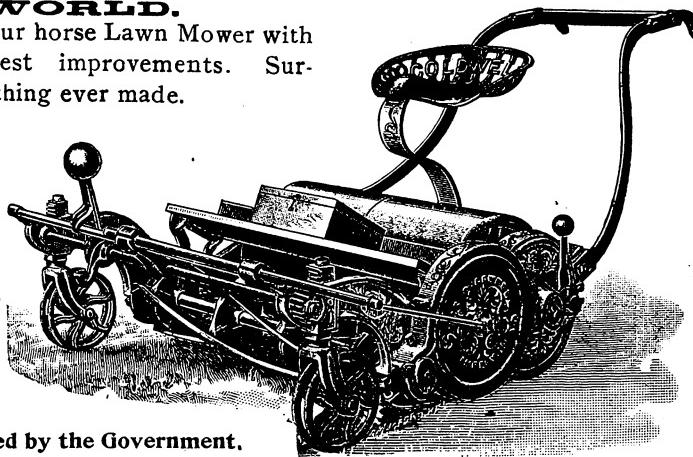
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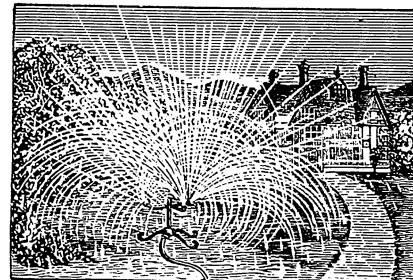
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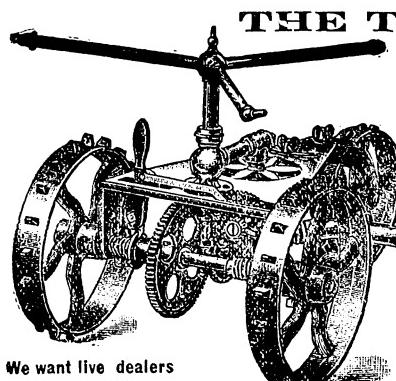
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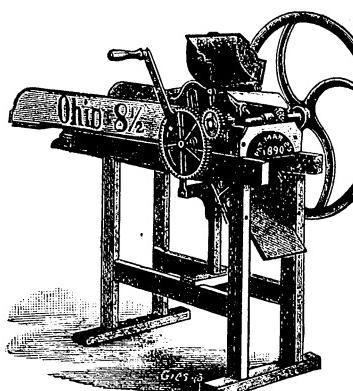
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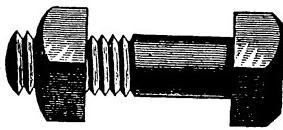
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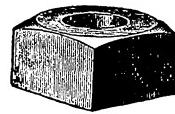
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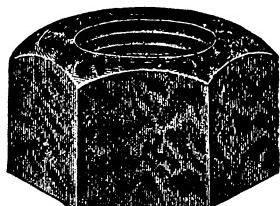
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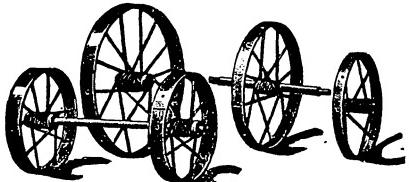
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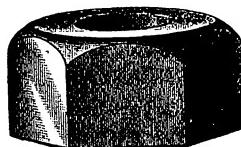
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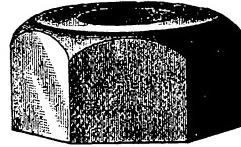
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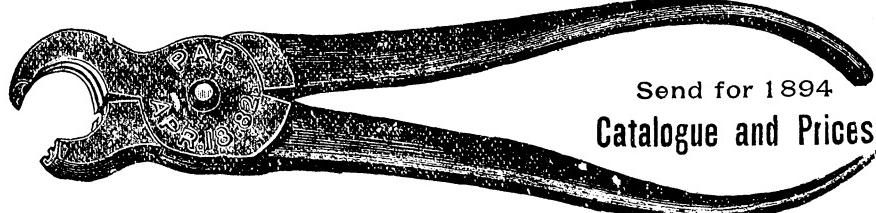
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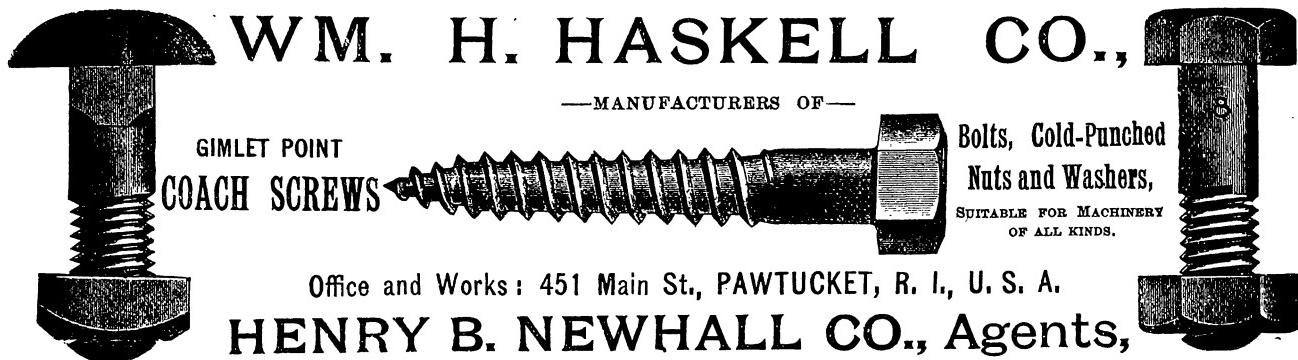


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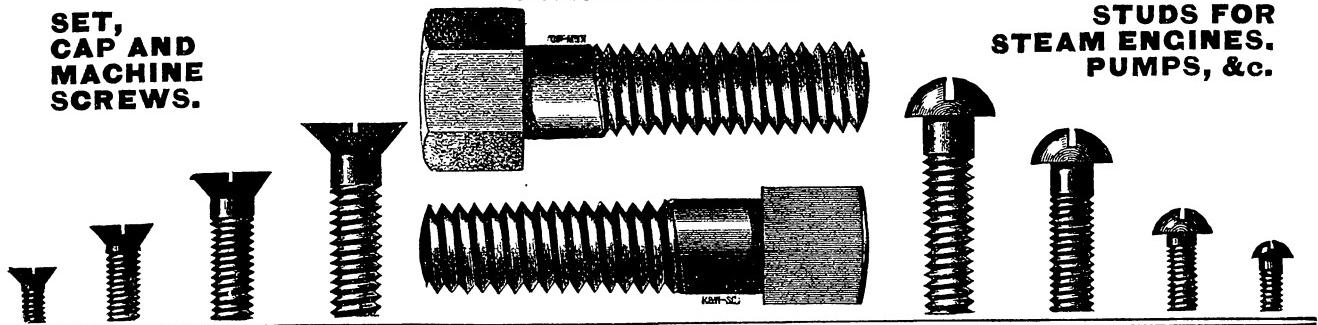
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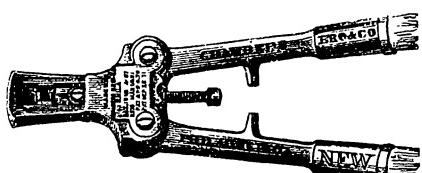
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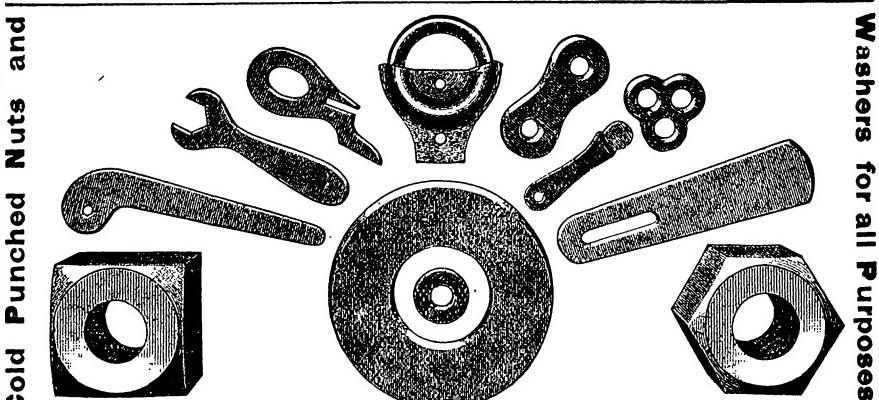
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Blocks, Tackle, Makers of.

Cleveland Block Co., Cleveland, O.

Fulton Iron & Engine Works, Detroit, Mich.

Union Hardware Co., Torrington, Ct.

Blowers.

Buffalo Forge Co., Buffalo, N. Y.

Champion Blower & Forge Co., Lancaster, Pa.

Euyett & Smith Mfg. Co., Detroit, Mich.

Sturtevant, B. F. & Co., Boston, Mass.

Boiler Plates.

Carbon Steel Co., Pittsburgh, Pa.

McLain, Wm. & Sons, Reading, Pa.

Lukens Iron & Steel Co., Coatesville, Pa.

Pottstown Iron Co., Pottstown, Pa.

Boilers, Copper.

Randolph & Clowes, Waterbury, Conn.

Boilers, Steam.

Babcock & Wilcox Co., 30 Cortlandt, N.Y.

Chandler & Taylor Co., Indianapolis, Ind.

Harrison Safety Boiler Wks., Phila., Pa.

Pollock, W. B., & Co., Youngstown, O.

Porter, H. K., Boston, Mass.

Southwark Fdy. & Mch. Co., Phila., Pa.

Sterling Co., Chicago, Ill.

Wetherill, Robt. & Co., Chester, Pa.

Bolt Cutters.

Chambers Bros. Co., Philadelphia.

Howard Iron Works, Buffalo, N. Y.

Porter, H. K., Boston, Mass.

Reece, Edw. F., Greenfield, Mass.

Wells Bros. & Co., Greenfield, Mass.

Books.

Republican Press, 14 Lafayette Place, N. Y.

Williams, David, 96-102 Reade, N. Y.

Box Banders.

Goodell, J. W., Burlington, Vt.

Box Straps and Corners.

Cary Mfg. Co., 5 to 1 Elm St., N. Y.

De Haven Mfg. Co., Brooklyn, N. Y.

Boxes, Hdw. Shell, &c.

Green, A. H., 22 Park Place, N. Y.

Brass, Manufacturers of.

Ansonia Brass & Copper Co., N. Y.

Davol, John & Sons, 100 John, N. Y.

Plume & Atwood Mfg. Co., N. Y.

Randolph & Clowes, Waterbury, Conn.

Rome Brass & Copper Co., Rome, N. Y.

Scovill Mfg. Co., Waterbury, Conn.

Waterbury Brass Co., 206 B'way, N. Y.

Brass Butt Hinges.

Tiebout, W. & J., 16 & 18 Chambers.

Brass Founders.

Cramp, Wm. & Sons S. & E. B. Co., Philadelphia, Pa.

Eynous-Evans Mfg. Co., Philadelphia, Pa.

Fralin, E. T., Lancaster, Pa.

Haight & Clark, Albany, N. Y.

Keys, W. W. & R. M. Co., Bridgeport, Conn.

North Bros. Mfg. Co., Phila., Pa.

Reeves, Paul S., Philadelphia.

Brass Goods.

Brass Goods Mfg. Co., 88 Chambers.

Bread and Cake Knives.

Christy Knife Co., Fremont, O.

Cincinnati Mfg. Co., Cincinnati, O.

Claus Shear Co., Fremont, O.

Bridge Builders.

Berlin Iron Bridge Co., East Berlin, Ct.

Bronze (Tobin).

Ansonia Bronze & Copper Co., 19-21 Cliff Street, N. Y.

Brooms and Brushes.

Lay, Jos. & Co., Ridgeville, Ind.

Rice Mfg. Co., New Durham, N. H.

Builders' Hardware.

Deitz, A. E., 97 Chambers St., N. Y.

Reading Hdwy. Co., Reading, Pa.

Russell & Erwin Mfg. Co., New York.

Yale & Towne Mfg. Co., Stamford, Ct.

Burr Wheels.

Torrance Iron Co., Troy, N. Y.

Butts and Hinges.

Clark Mfg. Co., Buffalo, N. Y.

McKinney Mfg. Co., Allegheny, Pa.

Sabin Machine Co., Montpelier, Vt.

Stanley Works, New Britain, Conn.

Tiebout, W. & J., 16 Chambers, N. Y.

Wrightsville Hdwy. Co., Wrightsville, Pa.

Cake Griddles.

Stuart & Peterson Co., Phila., Pa.

Calf Weaners.

Carroll Muzzel Co., Carroll, Ia.

Calipers and Dividers.

J. Stevens Arms and Tool Co., Chicopee Falls, Mass.

Starrett, L. S., Athol, Mass.

Car Axles.

Roberts, A. & P. & Co., Phila.

Carboy Stands.

Wolf, W. & L., Philadelphia, Pa.

Carriage Hardware, Makers of.

Clapp, E. D. Mfg. Co., Auburn, N. Y.

Covert's Saddlery Works, Farmer, N. Y.

Eccles, Richard, Auburn, N. Y.

Mckinnon Dash & Hdwy. Co., Ltd.,

Buffalo, N. Y.

Scranton Forging Co., Scranton, Pa.

Smith, H. D. & Co., Plantsville, Conn.

Cartridge Reloading Tools.

Ideal Mfg. Co., New Haven, Conn.

Carvers' Tools.

White, Van Gahan & Co., 15-17 Chat-ham Square, N. Y.

Casters, Wheel, &c.

Clark G. P., Windsor Locks, Conn.

Castings Cleaning Apparatus.

Tilghman's Patent Sand Blast Co., Ltd., Sheffield, England.

Castings, Iron and Steel.

Allentown Hdwy. Wks., Allentown, Pa.

The Lloyd Co., Youngstown, O.

Boston Casting Co., So. Boston, Mass.

The Burr & Houston Co., Brooklyn, N. Y.

Cheney, S. & Son., Manlius, N. Y.

Chester Steel Casting Co., Phila.

Chrome Steel Works, Brooklyn, N. Y.

Eureka Cast Steel Co., Chester, Pa.

Flagg, Stanley G. & Co., Phila.

Garland Foundry Co., Cleveland, O.

Haight & Clark, Albany, N. Y.

King & Andrews Co., Chicago, Ill.

Palmer & De Mooy Fdy. Co., Cleve-land, O.

Pratt & Cady Co., Hartford, Conn.

Sessions Foundry Co., Bristol, Conn.

Spencer's I. S. Sons, Gulliford, Conn.

Standard Fdy. & Mfg. Co., Cleveland, O.

Taylor & Boggis Fdy. Co., Cleveland, O.

Torrence Iron Co., Troy, N. Y.

Castings, Malleable.

Arcade Malleable Iron Co., Worcester, Mass.

Hammer & Co., Branford, Conn.

Torrance Iron Co., Troy, N. Y.

Catalogue Files.

Folding Paper Box Co., So. Bend, Ind.

Chains.

Bradlee & Co., Philadelphia.

Link Belt Engineering Co., Phila., Pa.

McKay, Jas. & Co., Pittsburgh, Pa.

Chimneys.

Phila. Engineering Works, Phila., Pa.

Chisels, Manufacturers of.

Buck Bros., Millbury, Mass.

Buck, Chas., Millbury, Mass.

White, L. & I. J. Co., Buffalo, N. Y.

Chucks.

Cushman Chuck Co., Hartford, Conn.

Hoggson & Pettis Mfg. Co., New Haven, Conn.

Skinner Chuck Co., New Britain, Conn.

Smith & Egge Mfg. Co., Bridgeport.

Union Mfg. Co., 103 Chambers, N. Y.

Whiton, D. E. Mach. Co., New London, Conn.

Clamps.

Egg Beaters.
North Bros. Mfg. Co., Philadelphia, Pa.

Electric Bells and Supplies.
Ostrander, W. R. & Co., 204 Fulton St.,
New York.
Wollensak, J. F., Chicago, Ill.

Electric Dynamo Machines.
Hanson & Van Winkle Co., Newark, N.J.

Elevators. Makers of.
Link-Belt Engineering Co., Phila., Pa.
Morse, Williams & Co., Phila., Pa.
Pennia, Elevator Engineering Co.,
Phila., Pa.
Variety Machine Co., Warsaw, N. Y.
Warner Elevator Mfg. Co., Cincinnati,
Ohio.

Emery and Emery Wheels.
Diamond Mach. Co., Providence, R. I.
N. Y. Belting & Packing Co., Ltd.,
N. Y.
Northampton Emery Wheel Co.,
Leeds, Mass.
Norton Emery Wheel Co., Worcester,
Mass.
Sterling Emery Wheel Co., 174 Fulton
St., N. Y.
Tanic Co., Stroudsburg, Pa.

Emery Wheel Dressers.
Bay State Stamping Co., Worcester,
Mass.

Engineers and Contractors.
Aiken, Henry, Pittsburgh, Pa.
Herrick, J. A., 284 Pearl St., N. Y.
Kennedy, Julian, Pittsburgh, Pa.
Laughlin, Alex. A., Pittsburgh, Pa.
Leach, D. R., Co., Pittsburgh, Pa.
McClure, Amsler & Co., Pittsburgh, Pa.
Pittsburgh Iron & Steel Engineering
Co., Pittsburgh, Pa.
Snythe, S. R. Co., Incorporated, Pitts
burgh, Pa.
Swindell, W. & Bros., Pittsburgh, Pa.

Engines, Gas and Gasoline.
Buckeye Mfg. Co., Union City, Ind.
Otto Gas Engine Works, Phila., Pa.
Springfield Gas Engine Co., Springfield,
Ohio.

Engines, Steam, Makers of.
Bass Foundry & Machine Works, Ft.
Wayne, Ind.
Chandler & Taylor Co., Indianapolis,
Ind.
Harris, Wm. A., Steam Engine Co.,
Providence, R. I.
Lane & Bodley Co., Cincinnati, Ohio.
Norwalk Iron Works Co., So. Norwalk
Conn.
Pennia, Diamond Drill & Mfg. Co.,
Birdsboro, Pa.
Phila. Engineering Works, Phila., Pa.
Southwark Foundry & Machine Co.,
Phila., Pa.
Tod, William & Co., Youngstown, O.
Totten & Hogg Iron & Steel Fdry. Co.,
Pittsburgh, Pa.
Wetherill, Robt. & Co., Chester, Pa.

Exhaust Tumblers.
Sweetser, W. A., Brockton, Mass.
Expansion Bolts.
Boone, W. C. Mfg. Co., Boonton, N. J.
Church, Isaac, Toledo, O.
Steward & Romaine Mfg. Co., Phila.,
Pa.

Exporters.
Flint & Co., 68 Broad St., N. Y.
Faucets, Self-Measuring.
Lane Bros., Poughkeepsie, N. Y.

Fanets, Wooden, Makers of.
John Sommer's Son, Newark, N. J.

**Feed-Water Heaters and
Purifiers.**
Davis, I. B. & Son, Hartford, Conn.
Harrison Safety Boiler Works, Phila.,
Pa.

National Pipe Bending Co., New
Haven, Conn.
Taunton Locomotive Mfg. Co., Taun
ton, Mass.
Webster, Warren & Co., Camden, N. J.
Whitlock Coll Pipe Co., Elmwood,
Conn.

Fence Ratchets.
Wire Fence Supply Co., Indianapolis
Ind.

Fencing, Iron and Wire.
Garnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Chess Bros., Pittsburgh, Pa.
Clinton Wire Cloth Co., Clinton, Mass.
Gilbert & Bennett Mfg. Co., 42 Cliff St.
Kilmel Mfg. Co., Newburgh, N. Y.
McCallip Fence & Wire Wks., Colum
bus, Ohio.

Randall Fence Co., Le Roy, N. Y.
The Van Dorn Iron Works Co., Cleve
land, O.
Wire Fence Supply Co., Indianapolis
Ind.

Files, Importers of.
Moss, F. W., 80 John St., N. Y.

Files and Rasps, Manufacturers of
Arcade File Works, Anderson, Ind.
Banker & White, Troy, N. Y.
Barnett, G. & H., 41 & 43 Richmond,
Philad.

McCaffrey File Co., Philadelphia.
Nicholson File Co., Providence, R. I.

Fire Brick, Makers of.
Borgener, Cyrus, Philadelphia, Pa.
Gardner, Jas. & Son, Cumberland, Md.
Kreischer, B. & Sons foot E. Houston
St., N. Y.
Maurer, H. & Son, 420 E. 23d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Valentine, M. D. & Bro. Co., Wood
bridge.

Fire Doors.
Berlin Iron Bridge Co., E. Berlin, Conn.
Coburn Trolley Track Mfg. Co., Hol
yoke, Mass.

Fishing Tackle.
Dame, Stoddard & Kendall, Boston,
Mass.

Flint and Emery Paper.
Baeder, Adamson & Co., Phila., Pa.

Flour Sifters.
Brownell Brush & Wire Goods Co.,
Cincinnati, Ohio.

Meyers, Fred. J. Mfg. Co., Hamilton, O.

Fodder Cutters.

Silver Mfg. Co., Salem, O.

Forges, Portable, &c.

Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lan
caster, Pa.
Foos Mfg. Co., Springfield, Ohio.
Sturtevant, B. F. Co., Boston, Mass.

Forgings, Iron and Steel.

Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel—Cambria Iron Co.,
Johnstown, Pa.
Frankford Steel Co., Phila., Pa.
Scranton Forging Co., Scranton, Pa.
U. S. Projectile Co., Brooklyn, N. Y.

Forks, Hay and Manure.

Iowa Farming Tool Co., Ft. Madison,
Iowa

Foundry Facings.

Dixon, Jos., Crucible Co., Jersey City,
N. J.
S. Obermeyer Co., Cincinnati, O.
Smith, J. D., Fdy. Supply Co., Cinn., O.

Foundry Kiddles.

Estey, W. S., 65 Fulton, N. Y.

Foundry Supplies.

Diamond Clamp & Flask Co., Rich
mond, Ind.
S. Obermeyer Co., Cincinnati, O.
Rice Mfg. Co., New Durham, N. H.
Smith, J. D., Fdy. Supply Co., Cinn., O.

Friction Clutches.

Brown, A. & F., 17 Dey St., N. Y.
Keystone Clutch & Mch. Wks., Phila., Pa.
Moore & White Co., Philadelphia, Pa.

Friction Cone.

Evans Friction Cone Co., Boston, Mass.

Furnaces, Foundry.

Byram & Co., Detroit, Mich.

Galvanized Material.

Jersey City Galvanizing Co., 112 John
St., N. Y.

Gas Producers.

Wood, R. D. & Co., Philadelphia, Pa.

Gas & Steam Puffers' Supplies.

Panocast, Henry B. & Co., Phila., Pa.

Gate Hinges.

Wrightsville Hdw. Co., Wrightsville,
Pa.

Gear Cutters.

D. E. Whiton Mach. Co., New London,
Conn.

Gears.

Boston Gear Works, Boston, Mass.
Lincoln Iron Works, Rutland, Vt.
Poole, Robt. & Son Co., Baltimore,
Md.
U. S. Projectile Co., Brooklyn, N. Y.

Glass Boards.

Canton Saw Co., Canton, O.

Glass Cutters.

Monce, S. G., Bristol, Conn.

Glue.

Baeder, Adamson & Co., Phila., Pa.
Dodd, A. W. & Co., Gloucester, Mass.
Russia Cement Co., Gloucester, Mass.

Grass Catchers.

Supplee Hardware Co., Phila., Pa.

Grinding and Polishing Ma chines.

Diamond Mach. Co., Providence, R. I.
Herrick & Cowell, New Haven, Conn.
Norton Emery Wheel Co., Worcester,
Mass.

Grinding Mills.

Foos Mfg. Co., Springfield, O.

Grindstone Dressing Machinery.

Blake & Johnson, Waterbury, Conn.

Grindstones.

Cleveland Stove Co., Cleveland, O.

Gun Implements.

Union Hdw. Co., Torrington, Conn.

Gunpowder, Makers of.

Lafin & Rand Powder Co., 29 Murray
St., N. Y.

Handles.

Cleveland Wood Turning Co., Cleve
land, O.
Piqua Handle & Mfg. Co., Piqua, Ohio.

Hangers, Door.

Chicago Spring Butt Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co.,
Holyoke, Mass.

Lane Bros., Poughkeepsie, N. Y.

Hardware Comm'n Merchants.

Graham, John H. & Co., 11 Chambers
St., New York.
Jacobus, W. H., 90 Chambers, N. Y.

Hardware Jobbers.

White, Van Glahn & Co., 15-17 Chat
ham Square, N. Y.

Hardware Manufacturers.

Russell & Erwin Mfg. Co., Chambers
St., New York.

Stearns, E. C. & Co., Syracuse, N. Y.

Streetier, N. R. & Co., Groton, N. Y.

Union Mfg. Co., 103 Chambers, N. Y.

Yale & Towne Mfg. Co., Stamford, Conn.

Hardware Mfrs.' Agents.

Bingham, W. Co., Cleveland, O.

Clarke, Thomas, St. John, N. B.

Graham, John H. & Co., 113 Chambers,
N. Y.

Sickles, Sweet & Lyon, 35 Barclay, N.Y.

Hardware Specimens.

Aline Shear Co., Bridgeport, Conn.

Burger Bros., Philadelphia, Pa.

Bourke Mfg. Co., Youngstown, O.

Clark Mfg. Co., Buffalo, N. Y.

Enterprise Mfg. Co., Philadelphia, Pa.

Ette & Henger Mfg. Co., St. Louis, Mo.

Gwinnett Mfg. Co., Hamilton, O.

Johnson, S. C., Racine, Wis.

North Bros. Mfg. Co., Philadelphia, Pa.

Ranson Hdw. Co., Burlington, Vt.

Sherman & Co., New Haven, Conn.

Wilson, J. Fred., Worcester, Mass.

Wrightsville Hdw. Co., Wrightsville,
Pa.

Harness Snaps.

Covert Mfg. Co., West Troy, N. Y.

Coverts' Saddlery Wks., Farmer, N. Y.

Fitch, W. & E. T., New Haven, Conn.

Hog Rings and Ringers.

Oakes & Irwin, Decatur, Ill.

Hoisting Machines.

Box, Alfred & Co., 314 Green, Phila.

Brown Hoisting & Conveying Mch. Co.,
Cleveland, Ohio.

Fulton Iron & Engine Wks., Detroit,
Mich.

Harrington, E., Son & Co., Phila.

Lane Bros., Poughkeepsie, N. Y.

Lidgerwood Mfg. Co., 96 Liberty, N. Y.

Lincoln Iron Works, Rutland, Vt.

McCoy, Jos. F. & Co., 20 Warren St.

Marls & Beekley, Philadelphia.

Moore Mfg. & Fdy. Co., Milwaukee,
Wis.

Morse, Williams & Co., Phila.

Sellers, Wm. & Co., Phila., and N. Y.

Spieldel J. G., Reading, Pa.

Yale & Towne Mfg. Co., Stamford, Ct.

Hollow Ware.

Every Stamping Co., Cleveland, O.

Bronson Supply Co., Cleveland, Ohio.

Cleveland Stamping & Tool Co., Cleve
land, O.

Stuart & Peterson Co., Phila., Pa.

Horse Nails, Makers of.

Capewell Horse Nail Co., Hartford,
Conn.

National Horse Nail Co., Vergennes,
Vt.

Putnam Nail Co., Neponset, Boston,
Mass.

Horse and Mule Shoes, Makers of.

Bryden Horse Shoe Co., Catasauqua,
Pa.

Burden Iron Co., Troy, N. Y.

Crescent Horse Shoe & Iron Co., Max
Meadows, Va.

Diamond State Iron Co., Wilmington,
Del.

Leonard, J., 446 West St., N. Y.

Old Dominion Iron & Nail Works Co.,
Richmond, Va.

Phoenix Horse Shoe Co., Poughkeepsie,
N. Y.

Rhode Island Perkins Horse Shoe Co.,
Providence.

Shoenberger & Co., Pittsburgh, Pa.

Standard Horse Shoe Co., Boston,
Mass.

Hose Menders.

Hudson, C. E. & Co., Leominster,
Mass.

Hose.

Cleveland Rubber Works, Cleveland, O.

N. Y. Betting & Packing Co., Ltd., 15
Park Row, N. Y.

Hydrants, &c.

McLean, John, 298 & 298 Monroe, N. Y.

Hydraulic Forging.

U. S. Projectile Co., Brooklyn, N. Y.

Hydraulic Jacks.

Dudgeon, Richard, 24 Columbia, N. Y.

McCoy, Jos. F. Co., 26 Warren St., N. Y.

Ice Cream Freezers.

Packer, C. W., Philadelphia, Pa.

White Mountain Freezer Co., Nashua,
N. H.

Ice Shavers.

Enterprise Mfg. Co., Philadelphia, Pa.

Injectors.

Eynon-Evans Mfg. Co., Philadelphia, Pa.

Jenkins Bros., New York.

Sherwood Mfg. Co., Buffalo, N. Y.

Insurance, Boiler.

Hartford Steam Boiler Inspection &
Insurance Co., Hartford, Conn.

Iron and Steel, Swedish.

Lundberg, Gustaf, Boston, Mass.

Milne, A. & Co., 1 Broadway, N. Y.

Iron Commission Brokers.

Butze, Adolph, St. Louis, Mo.

Corning, Edw. & Co., 28 Broadway, N. Y.

Corning, Barclay W. & Co., Phila.

Edting, Edw., Philadelphia.

Horne, John L. & Co., Philadelphia, Pa.

Hoffman, J. W. & Co., Philadelphia.

Levis, Henry & Co., Philadelphia.

Koeley, Jerome & Co., Philadelphia.

Lea, J. Tattnall & Co., Philadelphia.

Mohr, J. J., 430 Walnut, Philadelphia.

Pilling & Crane, Philadelphia, Pa.

Wister, L. & R. & Co., Phila., Pa.

Iron Ore.

Samuel, Frank, Philadelphia, Pa.

Iron, Merchants.

Barns, C. K. & Co., Philadelphia, Pa.

Borden & Lovell, 70 West, N. Y.

Bussentius & Cunlife, Philadelphia.

Corning, Edw. & Co., 28 Broadway, N. Y.

Cox, Justice, Jr., Philadelphia.

Cotton, Barclay W. & Co., Phila.

Hoffman, J. W. & Co., Philadelphia.

Leonard, J., 446 West St., N. Y.

Nicolls, Wheeler & Co., Philadelphia.

Ogden & Wallace, 577 to 583 Greenwich St., N. Y.

- Place, Geo., 145 Broadway, N. Y.**
Poole, Robt. & Son Co., Baltimore, Md.
Powell Planer Co., Worcester, Mass.
Prentiss Tool & Supply Co., N. Y.
Scranton Supply & Mchry. Co., Scranton, Pa.
Selbert, J. M., Philadelphia, Pa.
Sellers, Wm. & Co., Phila.
Seyfert's Sons, L. F., Philadelphia, Pa.
Sigourney Tool Co., Hartford, Conn.
Stephoe, J. & Co., Cincinnati, O.
Stow Flexible Shaft Co., Ltd., Phila.
Toomey, Frank, Philadelphia, Pa.
Walker Mfg. Co., Cleveland, O.
Wetherill, Robert & Co., Chester, Pa.
Wilson, W. A., Rochester, N. Y.
- Manufacturers for Hardware Manufacturers.**
 Adt, Jno. & Son, New Haven, Conn.
- Machine Knives.**
 Loring, Coes & Co., Worcester, Mass.
 Loyd, John, 558-562 Water St., N. Y.
 Simonds Mfg. Co., Fitchburg, Mass.
 New Britain Hdw. Mfg. Co., New Briton, Conn.
- Machine Screws.**
 Hubbell, Harvey, Bridgeport, Ct.
- Machine Tools.—See Machinery.**
- Machine Work.**
 Papping, J., 58th St. & 11th Ave., N. Y. City.
- Machinists' Scales.**
 Coffin & Leighton, Syracuse, N. Y.
 Starrett, L. S., Athol, Mass.
- Machinists' Tools and Supplies.**
 King, J. M. & Co., Waterford, N. Y.
 Sellers, Wm. & Co., Inc., Phila.
- Manufacturing Sites.**
 Harmon, T. H., Lock Haven, Pa.
- Measuring Tapes.**
 Keuffel & Esser Co., N. Y.
- Meat Choppers.**
 Clauss Shear Co., Fremont, Ohio.
- Meat Cutters.**
 North Bros. Mfg. Co., Philadelphia, Pa.
- Mechanical Instruction.**
 Correspondence School of Mechanics, Scranton, Pa.
- Merry-go-round.**
 Clark, W. J. & Co., Salem, Ohio.
- Metals.**
 Fearing, Wm. S., 100 Chambers, N. Y.
 Hendricks Bros., 49 Cliff, N. Y.
- Metal Brokers.**
 American Metal Co., N. Y.
- Metallic Ceilings.**
 Penn Iron Roofing & Corrugating Co., Phila., Pa.
- Metallurgists.**
 Britton, J. Blodgett, Phila., Pa.
- Mincing Knives.**
 Palmer Hdwy. Mfg. Co., Troy, N. Y.
- Mine Lamps.**
 Darby, Edw. & Sons, Phila., Pa.
 Leonard, B. E., Scranton, Pa.
- Mining Screens.**
 Harrington & King Perforating Co., Chicago, Ill.
 Howard & Morse, 45 Fulton, N. Y.
- Models, Makers of.**
 Franklin, H. H. Mfg. Co., Syracuse, N. Y.
 Ideal Machine Works, Hartford, Conn.
- Molding Sand.**
 Obermayer, S. Co., Cincinnati, O.
- Money Drawers.**
 Columbian Novelty Co., North East, Penna.
 Sun Mfg. Co., Greenfield, Ohio.
 Waddell Wooden Ware Wks., Greenfield, Ohio.
- Motors, Water and Electric.**
 Bolgiano Mfg. Co., Baltimore, Md.
 C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
 Dallett, Thomas H. & Co., Phila., Pa.
- Nail Keg Stock.**
 Crescent Mfg. Co., Detroit Mich.
- Nail Machinery.**
 Pittsburgh Mfg. Co., Pittsburgh, Pa.
- Nail and Tack Pullers.**
 Am. Specialty Co., Hartford, Conn.
 Scranton & Co., New Haven, Conn.
- Nails (Cut) and Spikes.**
 Borden & Lovell, 70 West, N. Y.
 Pottstown Co., Pottstown, Pa.
 Riverside Iron Wks., Wheeling, W. Va.
 Valley Steel Co., St. Louis, Mo.
- Nickel Plated Supplies.**
 Eddy Electric Mfg. Co., Windsor, Conn.
- Nickel Platers' Supplies.**
 Hanson & Van Winkle Co., Newark, N. J.
 Zuckerman & Levett Chemical Co., 10 to 14 Grand St., N. Y.
- Nickel Plating.**
 Rhodes, L. E. Co., Hartford, Conn.
- Norway Shapes, Rollers of.**
 Rowland, William & Harvey, Frankford, Philadelphia.
- Novelty Manufacturers.**
 Franklin, H. H. Mfg. Co., Syracuse, N. Y.
 Ideal Machine Works, Hartford, Conn.
- Nut Machines.**
 Dunham Nut Co., Unionville, Ct.
- Nuts, Bolts, &c., Makers of.**
 American Bolt Co., Lowell, Mass.
 American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Dunham Nut Co., Unionville, Conn.
 Haskell, Wm. H. Co., Pawtucket, R. I.
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.
 Pennsylvania Bolt & Nut Co., Lebanon, Pa.
 Port Chester Bolt & Nut Co., Port Chester, N. Y.
- Burdens, Burdall & Ward, Port Chester, R. I.**
 Russell, Burdall & Ward, Port Chester, N. Y.
- Sternbergh, J. H. & Son, Reading, Pa.**
 Wilson, J. Fred., Worcester, Mass.
 Wm. H. Haskell Co., Pawtucket, R. I.
- Oil Cups and Lubricators.**
 Sherwood Mfg. Co., Buffalo, N. Y.
- Oilers.**
 Wilmet & Hobbs Mfg. Co., Bridgeport, Conn.
- Oil Stones.**
 Plkt Mfg. Co., Pike Station, N. H.
- Orange Shears.**
 Henry, J. T. Mfg. Co., Hamden, Conn.
- Ores.**
 Wister, Francis, Philadelphia, Pa.
- Ox Shoes.**
 Scranton Forging Co., Scranton, Pa.
- Packing.**
 Morrison, Robert, St. Louis, Mo.
 N. Y. Belting & Packing Co., Ltd., N. Y.
- Padlocks.**
 Ames Sword Co., Chicopee, Mass.
 Fraim, E. T., Lancaster, Pa.
 Wolf, W. & L., Phila., Pa.
- Pails.**
 Richmond Cedar Wks., Richmond, Va.
- Paint.**
 Garry Iron & Steel Roofing Co., Cleveland, O.
- Paint Burners.**
 Dangler Stove & Mfg. Co., Cleveland, Ohio.
- Paint Cans.**
 Wilmet & Hobbs Mfg. Co., Bridgeport, Conn.
- Pants Stretchers.**
 Covert Mfg. Co., West Troy, N. Y.
- Patent Solicitors.**
 Butler, C. N., Phila., Pa.
 Jenner, H. W. T., Washington, D. C.
 Howson & Howson, Philadelphia and Washington.
 Stocking, E. B., Washington, D. C.
- Pattern Letters.**
 Wells, Heber, 157 William St., N. Y.
- Perforated Metal.**
 Clinton Wire Cloth Co., Clinton, Mass.
 Harrington & King Perforating Co., Chicago, Ill.
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Phosphor Bronze.**
 Phosphor Bronze Smelting Co., Limited, Philadelphia.
- Phosphor Tin.**
 Crescent Phosphorized Metal Co., Philadelphia, Pa.
 Halk & Nauman, 516 Pearl, N. Y.
- Picks and Mattocks.**
 Plumb, Fayette, Phila., Philadelphia, Pa.
- Pig Iron.**
 Houston, C. B. & Co., Philadelphia, Pa.
 Montour Iron & Steel Co., Danville, Pa.
 Naylor & Co., 45 Wall, N. Y.
 Pilling & Crane, Philadelphia, Pa.
 Samuel, Frank, Philadelphia, Pa.
- Pig Iron Storage.**
 Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.
- Pile Drivers.**
 Vulcan Iron Works, Chicago, Ill.
- Pipe, Bent.**
 National Pipe Bending Co., New Haven, Conn.
- Pipe Cutting and Threading Machines.**
 Armstrong Mfg. Co., Bridgeport, Conn.
 Bignal & Keeler Mfg. Co., St. Louis, Mo.
 Detrich & Harvey Mch. Co., Baltimore, Md.
 Merrill Mfg. Co., Toledo, O.
 Pancoast, Henry B. & Co., Phila.
 Saunders' Sons, D., Yonkers, N. Y.
 Walworth Mfg. Co., Boston, Mass.
- Pipe Grips.**
 Prentiss Vise Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**
 McNab & Harlin Mfg. Co., N. Y.
- Pipe, Water and Gas, Makers of.**
 Donaldson Iron Co., Ennauas, Pa.
 Riverside Iron Works, Wheeling, W. Va.
- Plane Irons, Manufacturers of.**
 Buck Bros., Millbury, Mass.
 Buck, Chas., Millbury, Mass.
- Planers.**
 Detrich & Harvey Mch. Co., Baltimore, Md.
- Plated Ware.**
 Boardman, L. & Son, New Haddam, Ct.
 Holmes & Edwards Silver Co., Bridgeport, Conn.
 Rogers, Wm. Mfg. Co., Hartford, Ct.
- Plate, Iron and Steel, Mfrs. of.**
 Etna-Standard Iron & Steel Co., Bridgeport, O.
 Lukens Iron & Steel Co., Coatesville, Pa.
 Mahoning Valley Iron Co., Youngstown, O.
 Moorhead-McLean Co., Pittsburgh, Pa.
 McIlvain & Sons, Reading, Pa.
 Pottstown Iron Co., Pottstown, Pa.
 Pottsville Iron & Steel Co., Pottsville, Pa.
- Plating, Nickel, Brass and Silver.**
 Wilmet & Hobbs Mfg. Co., Bridgeport, Conn.
- Polishing Machines.**
 Watson & Stillman, 204 E. 42d, N. Y.
- Post Hole Diggers.**
 Gibbs Mfg. Co., Canton, Ohio.
 Kohler, F. E. & Co., Canton, O.
- Poultry Nettings.**
 Barnum, E. T., Detroit, Mich.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
- Plates, Wire Cloth Co., Trenton, N. J.**
 "Silver Finish."
- Orange Shears.**
 Henry, J. T. Mfg. Co., Hamden, Conn.
- Powder.**
 Ladd & Rand Powder Co., 29 Murray New York Powder Co., 62 Liberty St., N. Y.
- Power Hack Saws.**
 Millers Falls Co., 93 Readie St., N. Y.
- Power Hammers.**
 Denecht & Eisenhardt, Philadelphia.
 Dupont Mfg. Co., St. Johnsbury, Vt.
 Jenkins & Lingle, Bellfonte, Pa.
 Miner & Peck Mfg. Co., New Haven Conn.
 Scranton & Co., New Haven, Conn.
- Power Transmitting Machinery.**
 Dodge Mfg. Co., Mishawaka, Ind.
- Presses, Dies, &c.**
 E. W. Bliss Co., Brooklyn, N. Y.
 Crosby, G. A. & Co., Chicago, Ill.
 Ferracute Mch. Co., Bridgeton, N. J.
 Stark Mch. & Tool Co., Buffalo, N. Y.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Mch. Co., Waterbury Ct.
- Presses, Power, Makers of.**
 Bliss, E. W. Co., Brooklyn, N. Y.
 Manville, E. J. Mch. Co., Waterbury, Ct.
 Stark Mch. & Tool Co., Buffalo, N. Y.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
- Printers.**
 Griffith, Axtell & Cady Co., Holyoke, Mass.
- Pruning Knives.**
 Gibbs Mfg. Co., Canton, O.
- Pulleys.**
 Brown, A. & F., 17 Dey St., N. Y.
 Dodge Mfg. Co., Mishawaka, Ind.
 Keystone Clutch Mch. Wks., Phila., Pa.
 Reeves Pulley Co., Columbus, Ind.
- Pulverizing Mills.**
 Bradley Fertilizer Co., Boston, Mass.
- Pumping Machinery.**
 Dean Bros. Steam Pump Works, Indianapolis, Ind.
 Goulds Mfg. Co., Seneca Falls, N. Y.
 Hooker Colville Steam Pump Co., St. Louis, Mo.
 Lucas, C. O. & Co., Greenville, Ohio.
 McGowan, J. H. & Co., Cincinnati, O.
 Maslin, J. & Son, Jersey City, N. J.
 Norwalk Iron Works Co., So. Norwalk Conn.
 Southwark Fdy. & Mch. Co., Phila., Pa.
 Valley Pump Works, Easthampton, Mass.
 Worthington, Henry R., 86 and 88 Liberty St., N. Y.
- Pumps, Makers of.**
 Deming Co., Salem, O.
 Douglas, W. & B., Middletown, Conn.
 Goulds Mfg. Co., Seneca Falls, N. Y.
 Myers, F. E. & Bro., Ashland, O.
- Punches.**
 Richards, I. P., Providence, R. I.
- Punches and Shears, Hand and Power.**
 Bertsch & Co., Cambridge City, Ind.
 E. W. Bliss Co., Brooklyn, N. Y.
 Crosby, G. A. & Co., Chicago, Ill.
 Ferracute Mch. Co., Bridgeton, N. J.
 Henderer, A. L., Wilmington, Del.
 Stark Mch. & Tool Co., Buffalo, N. Y.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Wals & Roos Punch & Shear Co., Cincinnati, Ohio.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
 Watson & Stillman, 204 E. 43d, N. Y.
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- Razor Sharpener.**
 Dame, Stoddard & Kendall, Boston, Mass.
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 Conroy, P. J. & Co., Philadelphia.
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 Clark & Cowles, Plainville, Conn.
 Cobb & Drew, Plymouth, Mass.
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 Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.
- Rolls, Chilled, Sand and Steel.**
 Birmingham Iron Foundry, Birmingham, Conn.
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 Garrison, A. Fdry. Co., Pittsburgh, Pa.
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 Seaman, Sleeth & Black, Pittsburgh.
 Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.
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 Berlin Iron Bridge Co., E. Berlin, Conn.
 Cambridge Roofing Co., Cambridge, O.
 Cincinnati Corrugating Co., Piqua, O.
 Kanesberg Roofing Co., Canton, O.
 N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
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- Sad Irons.**
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 Caldwell Mfg. Co., Rochester, N. Y.
 Fullman Sash Balance Co., Rochester, N. Y.
- Sash Cords and Chains.**
 Morton, Thos., 65 Elizabeth, N. Y.
 Ossawan Mills Co., Norwich, Conn.
 Samson Cordage Works, Boston, Mass.
 Smith & Egge Mfg. Co., Bridgeport.
- Sash Fasteners.**
 Wooster, F. V., Boston, Mass.
- Sash Locks.**
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 Ives, H. B. & Co., New Haven, Conn.
- Sash Pulleys.**
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 National Saw Co., 98 Readie St., N. Y.
 Simonds Mfg. Co., Fitchburg, Mass.
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 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Saw Sets.**
 Taintor Mfg. Co., 84-86 Chambers, N. Y.
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 Chatillon, John & Sons, 85-89 Cliff, N. Y.
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 Sidney Steel Scraper Co., Sidney, O.
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- Shade Hangers.**
 South, W. A. Co., Salem, Mass.
- Shaft Coupling.**
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- Shafting, Makers of.**
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- Cresson, Geo. V. Co., Philadelphia, Pa.**
 Fairmount Mch. Co., Philadelphia, Pa.
 Sellers, Wm. & Co., Inc., Phila., Pa.
 Stow Mfg. Co., Binghamton, N. Y.
- Shaft Support.**
 Decatur Shaft Support Co., Decatur, Ill.
- Shaped Iron and Steel, Manufacturers of.**
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 East Chicago Fdy Co., Chicago, Ill.

Allentown Rolling Mill, Allentown, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Passaic Rolling Mill Co., Paterson, N.J.
Pottsville Iron & Steel Co., Pottsville, Pa.
Roberts, A. & P. & Co., Phila., Pa.
The Phoenix Iron Co., Phila., Pa.

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Acme Shear Co., Bridgeport, Conn.
Heinrichs, R. Sons Co., Newark, N.J.

Sheet Iron and Steel, Manufacturers of.

Etna-Standard Iron and Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio.
Jersey City Galvanizing Co., 112 John St., N.Y.
Mahoning Valley Iron Co., Livingston, Ohio.
Morehead-McCleane Co., Pittsburgh.
Pierson & Co., 29 Broadway, N.Y.
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.

The Mahoning Valley Iron Co., Youngstown, O.
Alan Wood Co., Philadelphia.
W. Dewees Wood Co., McKeesport, Pa.

Sheet Zinc.

Matthiessen & Hegeler Zinc Co., La Salle, Ill.

Shelf Brackets.

Atlas Mfg. Co., New Haven, Conn.

Show Cases.

Union Show Case Co., Chicago, Ill.

Sinks.

Douglas, W. & B., Middletown, Conn.
Skates, Ice.

Keene Mfg. Co., Keene, N.H.
Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.

Skates, Roller.

Henley, M.C., Richmond, Ind.
Union Hardware Co., Torrington, Ct.
Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.

Slag Machines.

Cambria Iron Co., Johnstown, Pa.
Smelting Works.

Reeves, Paul S., 700 S. Broad, Phila.

Soldering Coppers.

Cleenden Bros., Baltimore, Md.
Covert Mfg. Co., West Troy, N.Y.

Soldering Furnaces.

Burgess Soldering Furnace Co., Columbus, Ohio.

Speaking Tubes.

Ostrander, W. R. & Co., 204 Fulton St., N.Y.
Wollensak, J. F., Chicago, Ill.

Spelter.

Matthiessen & Hegeler Zinc Co., La Salle, Ill.
Missouri Metal Co., St. Louis, Mo.

Spoons and Forks.

Boardman, L. & Son, New Haddam, Conn.
Holmes & Edwards Silver Co., Bridgeport, Conn.
Rogers, The Wm. Mfg. Co., Hartford, Conn.

Sporting Goods.

Hartley & Graham, 313-315 B'way, N.Y.

Spring Hinges.

Bommer Bros., Brooklyn, N.Y.
Chicago Spring Butt Co., Chicago, Ill.
Pullman Sash Balance Co., Rochester, N.Y.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Hdw. Co., 14 Warren St., N.Y.

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Avery Stamping Co., Cleveland, O.
Cleveland Stamping & Tool Co., Cleveland, O.

Staples.

Cobb & Drew, Plymouth, Mass.
Titchener, E.H. & Co., Binghamton, N.Y.

Steam Gauges.

Bristol Co., Waterbury, Conn.
Dienelt & Eisenhardt, Philadelphia.

Dudgeon, Richard, 24 Columbia Street, N.Y.
Trethewey Mfg. Co., Pittsburgh, Pa.

Steam Heating & Oil Separators.
Webster, Warren & Co., Camden, N.J.

Steam Separators.

Harrison Safety Boiler Wks., Phila., Pa.
Webster, Warren & Co., Camden, N.J.

Steam Specialties.

Lunkenheimer Co., Cincinnati, O.

Steel, Cold Rolled Strip.

Superior Steel Co., Pittsburgh, Pa.
Wilmett & Hobbs Mfg. Co., Bridgeport, Conn.

Steel Figures and Alphabet.
Krogsrud, W., 61 Fulton St., N.Y.

Steel Importers.

Abbott, Wheelock & Co., N.Y. and Boston.
Hobson, Francis, Seaman & Co., 97 John St., N.Y.

Jessop, Wm. & Sons, Sheffield, England, or 91 John, N.Y.
Milne, A. & Co., Broadway, N.Y.
Newton & Shipman, 83 John, N.Y.
Wetherell Bros., 93 Liberty St., N.Y.
Whitney, A. P. & Co., Edway, N.Y.
Wolf, T. H. & Co., Ltd., 118th Street and Harlem River, N.Y.

Steel (Musket's Special).

Jones, B. M. & Co., Boston.

Steel Manufacturers.

Etna-Standard Iron & Steel Co., Bridgeport, O.
Bethlehem Iron Co., S. Bethlehem, Pa.

Boker, Hermann & Co., 103 Duane St.

Carbon Steel Co., Pittsburgh, Pa.

Chester Steel Castings Co., Phila., Pa.

Chrome Steel Works, Brooklyn, N.Y.

Crescent Steel Co., Pittsburgh, Pa.

Frankford Steel Co., Philadelphia.

Gautier Steel Department of Cambria

Iron Co., Johnstown, Pa.

Hobson, Francis, Seaman & Co., 97 John St., N.Y.

Jones, Wm. & Sons, Sheffield, England, or 91 John, N.Y.

Kayser, Ellison & Co., Sheffield, Eng.

La Belle Steel Co., Pittsburgh, Pa.

Lukens Iron & Steel Co., Coatesville, Pa.

Morehead-McCleane Co., Pittsburgh, Pa.

Moss, F. W., 83 John, N.Y.

Pottsville Iron & Steel Co., Pottsville, Pa.

Richardson, C. F. & Son, Athol, Mass.

Standard Tool Co., Athol, Mass.

Stanley Rule & Level Co., 29 Chambers,

Starrett, L. S., Athol, Mass.

Stevens, J., Arms & Tool Co., Chicopee Falls, Mass.

Tower & Lyon, 95 Chambers St., N.Y.

Tools, Blacksmith and Wheelwright.

Buffalo Forge Co., Buffalo, N.Y.

Butts & Ordway, Boston, Mass.

Champion Blower & Forge Co., Lancaster, Pa.

Plumb, Fayette R., Philadelphia, Pa.

Wiley & Russell Mfg. Co., Greenfield, Mass.

Tools, Steam and Gas Fitters'.

Saunders' Sons, D., Yonkers, N.Y.

Torches, Oil and Gasoline.

Dangler Stove & Mfg. Co., Cleveland, O.

Schneider & Trenkamp Co., Cleveland, Ohio.

Transom Lifters.

Wollensak, J. F., Chicago, Ill.

Trucks, Manufacturers of.

Clark, G. P., Windsor Locks, Conn.

Tubes, Seamless Drawn Copper.

Ansonia Brass & Copper Co., 19 and 21 Cliff, N.Y.

Randolph & Clowes, Waterbury, Conn.

Tubes, Steel.

Avery Stamping Co., Cleveland, O.

Leng's, John S. Son & Co., 4 Fletcher St., New York.

Shelby Steel Tube Co., Shelby, Ohio.

U.S. Projectile Co., Brooklyn, N.Y.

Tumbling Barrels.

Henderson Bros., Waterbury, Conn.

Turubuckles.

Central Iron & Steel Co., Brazil, Ind.

Cleveland City Forge & Iron Co., Cleveland, O.

Merrill Bros., Brooklyn, E.D.

Twist Drills, Makers of.

Cleveland Twist Drill Co., Cleveland, O.

Morse Twist Drill & Machine Co., New Bedford, Mass.

New Process Twist Drill Co., Taunton, Mass.

Standard Tool Co., Cleveland.

Valves, Gas, Water and Steam.

Chapman Valve Mfg. Co., Boston.

Eynon-Evans Mfg. Co., Philadelphia, Pa.

Jenkins Bros., 71 John, N.Y.

Lunkenheimer Co., Cincinnati, O.

McNab & Harlin Mfg. Co., 56 John, N.Y.

Ventilating Fans.

Huyett & Smith Mfg. Co., Detroit, Mich.

Ventilator Appliances.

Howard & Morse, 16 Fulton St., N.Y.

Vise Jaws.

Matthiessen & Hegeler Zinc Co., La Salle, Ill.

Tacks, Brads, Staples, &c.

Atlas Tack Corporation, Boston, Mass.

Chess Bros., Pittsburgh, Pa.

Cleenden Bros., Baltimore, Md.

Cobb & Drew, Plymouth, Mass.

Grand Crossing Tack Co., Grand Crossing, Ill.

Taps and Dies.

Butterfield & Co., Derby Line, Vt.

Carpenter, J. M., Tap & Die Co., Pawtucket, R.I.

Manning, Maxwell & Moore, 111 Liberty St., N.Y.

Riehle Bros. Testing Mach. Co., Philadelphia.

Testing Machines.

Riehle Bros. Testing Mach. Co., Phila., Pa.

Theatrical Hardware.

Wollensak, J. F., Chicago, Ill.

Thill Springs.

Frost Thill Spring Co., Boston, Mass.

Sabin Machine Co., Montpelier, Vt.

Thrust Collars.

Gouverneur Mach. Co., Gouverneur N.Y.

Timber and Mineral Lands.

Robertson, E. Co., Cincinnati, O.

Time Record.

Scattergood, H. W., Phila., Pa.

Tin Plate Machinery.

Lloyd Booth Co., Youngstown, Ohio.

Tire Upsetters.

Butts & Ordway, Boston, Mass.

Toe Calks, Steel.

Burke, P. F., Boston, Mass.

Tool Blocks.

Hulbut-Rogers Mch. Co., South Sudbury, Mass.

Tool Chests.

Am. Tool Co., 200 W. Houston St., N.Y.

Tool Holders.

Armstrong Bros. Tool Co., Chicago, Ill.

Toots.

Brown, R. H. & Co., New Haven, Conn.

Fray, Jno. S. & Co., Bridgeport, Conn.

Mayhew, H. H. Co., Shelburne Falls, Mass.

Millers Falls Co., 93 Readme, N.Y.

Richardson, C. F. & Son, Athol, Mass.

Stanley Rule & Level Co., 29 Chambers,

Starrett, L. S., Athol, Mass.

Stevens, J., Arms & Tool Co., Chicopee Falls, Mass.

Tower & Lyon, 95 Chambers St., N.Y.

Tools.

Brown, R. H. & Co., New Haven, Conn.

Fray, Jno. S. & Co., Bridgeport, Conn.

Mayhew, H. H. Co., Shelburne Falls, Mass.

Miller, A. P. & Co., Edway, N.Y.

Wetherell Bros., 93 Liberty St., N.Y.

Wolff, R. H. & Co., Ltd., 118th St. and

Harlem River, N.Y.

Wright & Colton Wire Cloth Co., Worcester, Mass.

Wire Cloth.

Barnum, E. T., Detroit, Mich.

Clinton Wire Cloth Co., Clinton, Mass.

Darby, Edward & Sons, Philadelphia.

Estey, W. S., 65 Fulton, N.Y.

Gilbert & Bennett Mfg. Co., 42 Cliff St.

Howard & Morse, 45 Fulton, N.Y.

Ludlow-Saylor Wire Co., St. Louis, Mo.

Schoeller & Sons, Buffalo, N.Y.

Wickwire Bros., Cortland, N.Y.

Williamson, C. T., Wire Novelty Co., Newark, N.J.

Wire Goods Co., Worcester, Mass.

Wire Machinery.

Am. Tool Wks., Cleveland, O.

Manville, E. J. Mch. Co., Waterbury, Ct.

Morgan Construction Co., Worcester, Mass.

Waterbury Mch. Co., Waterbury, Conn.

Wire Straightening and Cutting Machinery.

Adt, John & Son, New Haven, Conn.

Wire Fences, See Fencing, Iron and Wire.

Wire Goods, Manufacturers of.

Bromwell Brush & Wire Goods Co., Cincinnati, Ohio.

Darby, Edward & Sons, Phila.

Gilbert & Bennett Mfg. Co., 42 Cliff St., N.Y.

Ludlow-Saylor Wire Co., St. Louis, Mo.

Ossawamills Co., Norwich, Conn.

Schoeller & Sons, Buffalo, N.Y.

Wickwire Bros., Cortland, N.Y.

Williamson, C. T., Wire Novelty Co., Newark, N.J.

Wire Goods Co., Worcester, Mass.

Wire Nails.

Bond Nail Co., Raynham, Mass.

Indiana Wire Fence Co., Crawfordsville, Ind.

Klimer Mfg. Co., Newburg, N.Y.

New Castle Wire Nail Co., New Castle, Pa.

Phillips, Townsend & Co., Phila., Pa.

Salem Wire Nail Co., Salem, O.

Taunton Wire Nail Co., Taunton, Mass.

Whitney, A. R. & Co., New York City.

Wire Rods, Steel.

American Wire Co., Cleveland, Ohio.

New Castle Wire Nail Co., New Castle, Pa.

Washburn & Moen Mfg. Co., Worcester, Mass.

Mass.

Whitney, A. R. & Co., 17 B'way, N.Y.

Wolff, R. H. & Co., Ltd., 118th Street and

Harlem River, N.Y.

Wire Rope, Iron and Steel, Makers.

Broderick & Bascom Rope Co., St. Louis, Mo.

California Wire Works, San Francisco.

Hazard Mfg. Co., Wilkes-Barre, Pa.

A. Leschen & Sons Co., St. Louis.

ALPHABETICAL INDEX TO ADVERTISERS.

Abbott, Wheelock & Co.....	18	Brown, A. & F.....	42	Crawford Mfg. Co.....	79	Goulds Mfg. Co.....	86
Acme Shear Co.....	71	Brown, E. E. & Co.....	95	Crescent Horse Shoe & Iron Co.....	101	Gouverneur Machine Co.....	52
Adt, John & Son.....	41	Brown Hoisting & Conveying Mch. Co.....	36	Crescent Mfg. Co.....	8	Graham, John H. & Co.....	88
Etna-Standard Iron & Steel Co.....	20	Brown, R. H. & Co.....	62	Crescent Phosphorized Metal Co.....	3	Grand Crossing Tack Co.....	11
Aiken, Henry.....	26	Bryan Mfg. Co.....	103	Crescent Steel Co.....	16	Grand Rapids Cycle Co.....	79
Alexander Bros.....	37	Bryden Horse Shoe Co.....	99	Cresson, Geo. V. Co.....	49	Green, A. H.....	83
Allentown Hdw. Wks.....	27	Buck Bros.....	71	Croissant, M.....	88	Griffith, Axtell & Cady Co.....	63
Allentown Rolling Mills.....	27	Buck, Chas.....	71	Crosby, G. A. & Co.....	39	Gwiner Mfg. Co.....	62
Am. Axe & Tool Co.....	75	Buckeye Mfg. Co.....	30	Crown Smelting Co.....	3	Haight & Clark.....	25
Am. Bolt Co.....	107	Buffalo Forge Co.....	116	Cushman Chuck Co.....	46	Halk & Naumann.....	3
Am. Metal Co.....	3	Buffalo Scale Co.....	97	Dallett, Thos. H. & Co.....	48	Halsey, Jas. T.....	46
Am. Pig Iron & Storage Warrant Co.	19	Burden Iron Co.....	99	Dame, Stoddard & Kendall.....	78	Halsey, W. S. & Co.....	24
Am. Screw Co.....	13	Burgess Soldering Furnace Co.....	83	Dangler Stove & Mfg. Co.....	84	Hamilton Machine Tool Co.....	42
American Specialty Co.....	71	Burke, P. F.....	101	Darby, Edw. & Sons.....	8	Hammer & Co.....	97
Am. Steel Scraper Co.....	108	Burr & Houston Co.....	23	Davis, I. B. & Son.....	31	Hanson & Van Winkle Co.....	28
Am. Tool Co.....	70	Bussenus & Cunliffe.....	54	Davis, W. P.....	54	Hardware Board of Trade.....	57
American Tool Works.....	54	Butler, C. N.....	6	Davol, John & Sons.....	2	Harrington, E., Son & Co.....	41
American Wire Co.....	10	Butler Mfg. Co.....	65	Dean Bros. Steam Pump Works.....	35	Harrington & King Perforating Co.	9
Ames Sword Co.....	95	Butterfield & Co.....	46	Decatur Shaft Support Co.....	104	Harrington & Richardson Arms Co.	80
Amidon Tool Corporation.....	70	Butts & Ordway.....	40	DeHaven Mfg. Co.....	70	Harris Mfg. Co.....	79
Anderson, F. S. & Co.....	104	Butze, Adolph.....	59	Deitz, A. E.....	83	Harris, Wm. A. Steam Engine Co.	31
Ansonia Brass & Copper Co.....	2	Byram & Co.....	28	Deming Co.....	64	Harrison, W. P. & Co.....	80
Arcade File Works.....	68	C. & C. Electric Co.....	28	Detrick & Harvey Machine Co.....	51	Harrison Safety Boiler Wks.....	30
Arcade Malleable Iron Co.....	22	Caldwell Mfg. Co.....	95	Diamond Clamp & Flask Co.....	116	Hart Mfg. Co.....	46
Arcade Mfg. Co.....	89	California Wire Works.....	6	Diamond Machine Co.....	52	Hartford Steam Boiler Insp. and Ins. Co.....	31
Armstrong Bros. Tool Co.....	48	Cambrria Iron Co.....	19&22	Diamond State Iron Co.....	99	Hartley & Graham.....	1
Armstrong Mfg. Co.....	47	Cambridge Iron & Steel Co.....	15	Dienelt & Eisenhardt.....	43	Hartzell, Geo. W.....	103
Arnold Metal Wheel Co.....	108	Cambridge Roofing Co.....	15	Dietz, Schumacher & Co.....	44	Haskell, Wm. H. Co.....	108
Athol Machine Co.....	65	Canfield, H. O.	37	Disston, Henry & Sons.....	67	Hazard Mfg. Co.....	6
Atkins, E. C. & Co.....	68	Canton Saw Co.....	64	Dixon, Jos., Crucible Co.....	37	Heinrich's R. Sons Co.....	71
Atlas Mfg. Co.....	116	Capewell Horse Nail Co.....	100	Dodd, A. W. & Co.....	115	Henderer, A. L.....	43
Atlas Tack Corporation.....	11	Carbon Steel Co.....	20	Dodge Mfg. Co.....	49	Henderson Bros.....	53
Avery Stamping Co.....	76	Carlin's Sons, Thomas.....	54	Donaldson Iron Co.....	23	Hendey Machine Co.....	60
Ayer, H. C. & Gleason Co.....	41	Carpenter J. M. Tap & Die Co.....	115	Douglas, W. & B.	64	Hendricks Bros.....	2
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Bardsley, J.....	97	Chadborne & Coldwell Mfg. Co.....	104	Dunham Nut Co.....	106	Henry, J. T. Mfg. Co.	82
Barns, C. K. & Co.....	22	Chambers Bros. Co.....	108	Dupont Mfg. Co.....	39	Herrick, J. A.....	27
Barnes, W. F. & John.....	40	Champion Blower & Forge Co.....	46	Durant, W. N.	36	Herrick & Cowell.....	42
Barnett, G. & H.....	69	Champion Iron Co.....	7	Dwight Slate Machine Co.....	40	Hiertz, T. & Son.....	3
Barnum, E. T.....	9	Chandler & Taylor Co.....	28	Eagle Anvil Works.....	68	Higginanum Hdw. Co.....	66
Bass Foundry & Machine Works.....	30	Chapman Valve Mfg. Co.....	34	Eagle Bicycl Mfg. Co.....	115	Hill, Clarke & Co.....	55
Bay State Stamping Co.....	52	Chatillon, John & Sons'.....	81	East Chicago Foundry Co.....	23	Hobson, F., Seaman & Co.....	18
Bement, Miles & Co.....	43	Chenev, S. & Son.....	23	Eccles, Richard.....	96	Hoffman, C. & A.	74
Bemis & Call Hardware & Tool Co.	97	Chess Bros.	23	Eddy Electric Mfg. Co.....	28	Hoffman, J. W. & Co.	17
Berger Bros.....	90	Chester Steel Casting Co.....	24	Enterprise Mfg. Co. of Pa.	87	Hogan, John L. & Co.	17
Berlin Iron Bridge Co.....	14	Chicago Fire Arms Co.	78	Estey, W. S.....	6	Hoggson & Pettis Mfg. Co.	46
Bertsch & Co.....	39	Chicago Spring Butt Co.....	93	Ette & Henger Mfg. Co.....	105	Hollands Mfg. Co.	65
Bethlehem Iron Co.....	22	Christy Knife Co.	73	Etting, Edw. J.	17	Holmes & Edwards Silver Co.	72
Bevin Bros. Mfg. Co.....	79	Chrome Steel Works.....	19	Eureka Cast Steel Co.	116	Hoover, C. B. & Co.	17
Bickford Drill & Tool Co.....	42	Church, Isaac.....	103	Evans-Friction Cone Co.	3	Howard Iron Works.....	69
Bicycle Step Ladder Co.....	87	Cincinnati Corrugating Co.	9	Excelsior Cutlery Co.	73	Howard & Morse.....	7
Bigelow, C. R.....	55	Clafsten Mfg. Co.	37	Eynon-Evans Mfg. Co.	31	Howson & Howson.....	6
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Blair Mfg. Co.....	105	Cleveland City Forge & Iron Co.	1	Fitch, W. & E. T.	115	Ideal Mfg. Co.	79
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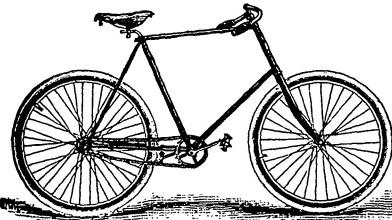
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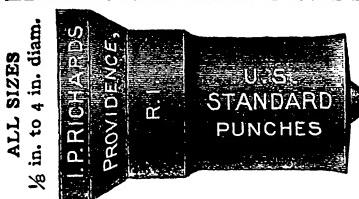
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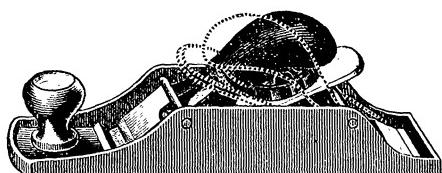
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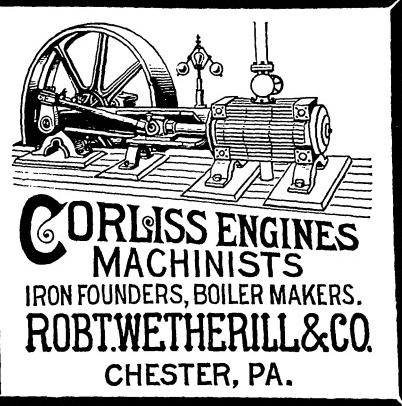
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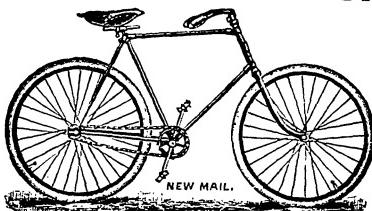
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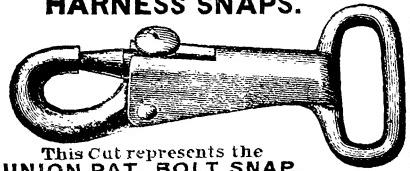
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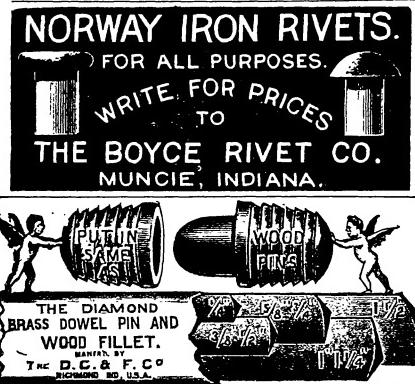


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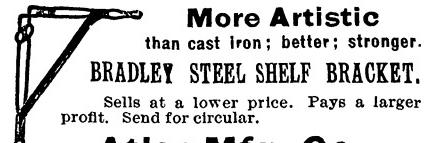
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THE IRON AGE

THURSDAY, AUGUST 2, 1894.

The Keating Pipe Yard.

The pipe yard of Edward F. Keating, at 435-437 Water street, New York, is admirably arranged for the convenient storing and the quick and easy delivery of pipe of all sizes. One man can, unaided, raise without trouble and load upon the truck a length of the heaviest pipe, weighing 1200 pounds. The building is 120 feet deep by 40 feet front. It is divided into two compartments by a center row of heavy wooden columns. One side is used for the storage of small or bundle pipe and the other for piece or large pipe. Running down each room is a hand traveling crane carried on light rails placed on wooden stringers supported by the center row of columns and the side

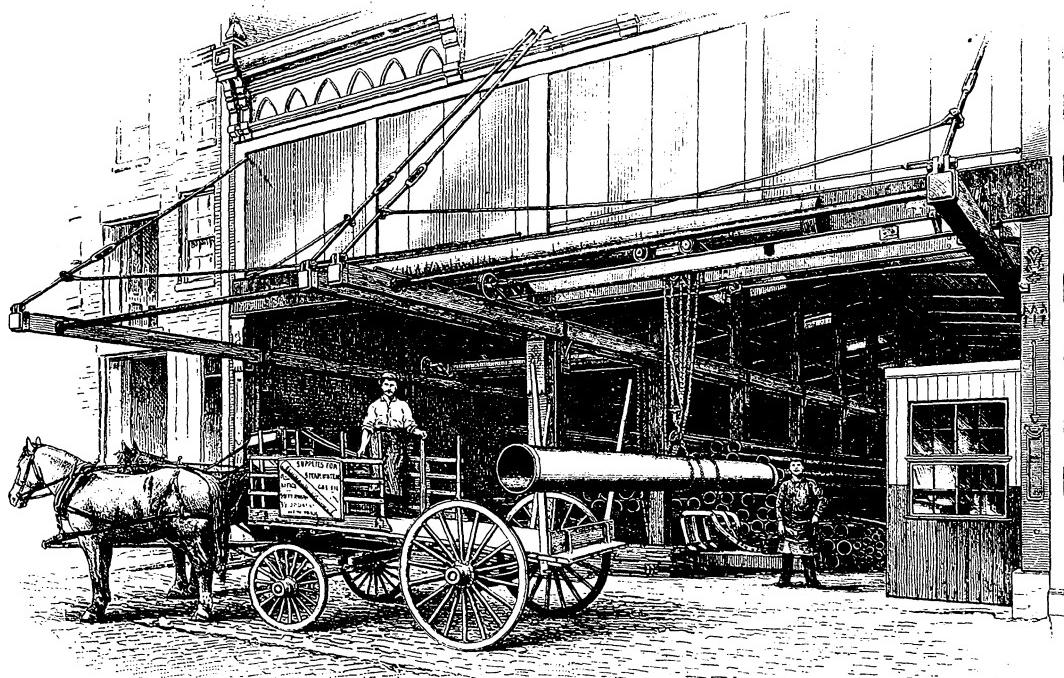
ing station, have sent in their report to Secretary Herbert. They propose a cut in the bar 250 feet wide and 30 feet deep, the cost of which is estimated at \$100,000. The work would take about a year to complete.

An Ancient Ironclad.

The idea of protected ships, such as the modern men-of-war, is by no means an absolutely new one. This is proved, says the *Western Mail* of Cardiff, by the fact that an armored vessel was constructed, though crudely, of course, as far back as 1585 by a shipwright of Antwerp during the wars between the Spaniards and the Dutch. The greater part of the Netherlands had come into the possession of the House of Habs-

the masts, and the rest protected by the bulwarks.

They were so confident that the craft would rout the enemy that they called it "Finis Belli," thinking it no doubt would put an end to the war. Unfortunately, however, the early ironclad proved a disastrous failure, getting stuck upon a bank of the Scheldt after a very short and unhappy career. The Spaniards were greatly amused with the untimely end of the great vessel, while the brave burghers of Antwerp changed the name from "Finis Belli" to "Perdito Expens," or "Money Thrown Away." The crew then deserted the ship, and the Spaniards, after defeating the Netherlanders in a naval battle, carried the monster in triumph to the camp of Alexander of Parma, where it became one of the sights of the times. The



THE KEATING PIPE YARD.

walls. These tracks extend beyond the front of the building, to which their outer ends are secured by turnbuckle rods, as shown in the engraving. The ends of the tracks are in line with the curbstone, so that it is necessary for the truck to obstruct only a small part of the sidewalk in order to be reached by the crane. The ends of the tracks are supported against side movement by the diagonal tie rods shown. The front of the building is closed by vertically sliding doors which pass through openings in the stringers. The gap thus made in each rail is closed by a small section of rail when the crane is in operation. Each crane is of 2 tons capacity. Each can be handled by one man, even when loaded to its full capacity.

The naval officers detailed to survey Pearl Harbor, Hawaii, with a view to obtaining definite information as to the work that must be done before the establishment there of a naval and coal-

burg in 1477, but in the early part of the sixteenth century it passed to the Spanish crown. At this time the principles of the Reformation had spread throughout the lowlands, and when the Spaniards instituted the inquisition there, disturbances broke out. The Spanish soldiery pillaged the towns of the Netherlands in their work of suppressing the rebellion, and Antwerp being a margravate, suffered greatly. In the summer of 1585 it was invaded by the Spaniards, both by land and water, and the people of Antwerp built the first protected ship on record in an attempt to break through the line of besiegers on the river. It was a craft of unusual size, with flat bottom, its sides armed with iron plates fastened into great beams of wood. When finished, the builders thought it a floating castle, impregnable to the artillery and missiles of those days, which should crush all opposition, as it contained a great number of men, some of whom were placed like sharpshooters in the tops of

city of Antwerp was taken August 17, 1585, and so the first ironclad on record came to an unfortunate end.

Lake freights have of late been steadily declining. Very little grain is being offered to Buffalo, and for the moment the grain carrying trade is in a condition of extreme depression.

The condition of land tenure in the United Kingdom is curiously illustrated in the *Financial Reform Almanac*. Says that authority: "Of the 72,000,000 acres in this country, 50,000,000 are owned by less than 15,000 persons, and of these 50,000,000 no less than 30,000,000 acres are owned by 1000 persons. It is estimated that, leaving out blocks of under an acre in extent, 180,524 persons practically own the whole of England, Scotland, Ireland and Wales: that 10,000 persons own two-thirds of England and Wales, 300 two-thirds of Scotland and 1900 two-thirds of Ireland."

The Production of Pig Iron.

The American Iron and Steel Association has published its statistics of the production of pig iron for the first six months of the current year.

The total production of pig iron in the United States in the first half of 1894 was 2,717,983 gross tons, against 2,561,584 tons in the second half of 1893, an increase of 156,399 tons. As compared with the first half of 1893, however, the production in the first half of 1894 shows a great decline, the figures for the first half of 1893 being 4,562,918 tons, or 1,844,935 tons more than the production in the first half of 1894.

The production of pig iron in the last 12 months, from July 1, 1893, to July 1, 1894, was 5,279,567 gross tons. In 1892 the production was 9,157,000 tons. Not since the dull year 1885 have we made as little pig iron in one year as in the last 12 months.

An examination of the following table shows the States which increased their production of pig iron in the first half of 1894 as compared with the second half of 1893, and also the States which decreased their production. From the same table it will be seen that four States which made pig iron in the first half of 1893 made no pig iron in the first half of 1894—Massachusetts, North Carolina, Indiana, and Minnesota. Five other States show only a nominal production of pig iron in the first half of 1894—Connecticut, Maryland, Texas, Missouri, and Oregon.

Total Production of Pig Iron.

Gross tons of 2240 pounds. (Includes spiegeleisen.)

States.	First half of 1893.	Second half of 1893.	First half of 1894.
Massachusetts.....	4,119	3,734	.....
Connecticut.....	7,335	5,143	3,389
New York.....	140,776	50,339	91,611
New Jersey.....	39,598	34,707	36,878
Pennsylvania.....	2,225,982	1,417,060	1,350,498
Maryland.....	89,29	62,04	3,974
Virginia.....	152,155	150,701	146,215
North Carolina.....	2,445	398	.....
Georgia.....	16,519	23,106	22,540
Alabama.....	447,948	278,940	255,950
Texas.....	5,838	419	2,223
West Virginia.....	66,398	15,193	23,932
Kentucky.....	37,281	10,220	19,639
Tennessee.....	128,539	79,376	100,223
Ohio.....	594,643	280,622	332,804
Indiana.....	5,813	254	.....
Illinois.....	385,771	69,490	216,121
Michigan.....	81,907	35,631	46,309
Wisconsin.....	107,855	23,917	38,372
Minnesota.....	10,373	.....	.....
Missouri.....	22,329	10,031	892
Colorado.....	37,119	8,436	25,405
Oregon	2,976	1,763	1,000
Totals.....	4,562,918	2,561,584	2,717,938

The production of charcoal iron was as follows:

Production of Charcoal Pig Iron.

States.	First half of 1893.	Second half of 1893.	First half of 1894.
Massachusetts.....	4,119	3,734	.....
Connecticut.....	7,335	5,143	3,389
New York.....	9,350	3,060	4,075
Pennsylvania.....	1,848	2,750	2,987
Maryland.....	2,400	2,207	1,665
Virginia.....	1,08	.....	.....
Georgia.....	5,546	6,782	5,600
Alabama.....	44,501	22,682	19,554
Texas.....	5,838	419	2,223
Kentucky.....	80	2,019	.....
Tennessee.....	31,875	22,971	1,500
Ohio.....	5,087	13,260	5,786
Michigan.....	81,907	35,631	46,309
Wisconsin.....	32,810	18,6 8	7,747
Missouri.....	7,104	8,540	892
Oregon	2,976	1,763	1,000
Totals.....	237,240	149,549	102,697

The production of iron made with anthracite, or a mixture of anthracite and coke, as a fuel was as follows:

Production of Anthracite and Mixed Anthracite and Coke Pig Iron.

States.	First half of 1893.	Second half of 1893.	First half of 1894.
New York.....	95,884	28,486	44,533
New Jersey.....	39,598	34,707	36,878
Pennsylvania.....	719,752	423,102	330,836
Totals.....	855,234	492,295	412,047

The output of coke iron by States was as follows:

Production of Bituminous Coal and Coke Pig Iron.

States.	First half of 1893.	Second half of 1893.	First half of 1894.
New York.....	41,542	18,793	43,003
Pennsylvania	1,504,362	985,208	1,016,848
Maryland.....	87,329	59,887	2,309
Virginia.....	151,647	150,701	146,215
North Carolina.....	2,445	398	.....
Georgia.....	10,963	16,384	16,940
Alabama.....	403,417	256,278	236,396
West Virginia.....	66,398	15,193	23,932
Kentucky.....	37,201	8,201	19,639
Tennessee.....	96,664	56,405	98,723
Ohio.....	569,606	287,362	327,018
Indiana.....	5,313	254	.....
Illinois.....	335,771	60,490	216,121
Wisconsin.....	75,098	5,309	30,635
Minnesota.....	10,373	.....	.....
Missouri.....	15,225	1,491	.....
Colorado.....	97,119	8,486	25,465
Totals.....	3,470,444	1,919,740	2,203,239

The make in some of the leading districts is shown in the following table:

Production in Certain Districts.

	First half of 1893.	Second half of 1893.	First half of 1894.
Pennsylvania:			
Lehigh Valley.....	243,205	137,510	92,539
Schuylkill Valley.....	227,209	118,338	127,914
Upper Susquehanna Valley.....	74,579	29,956	46,780
Lower Susquehanna Valley.....	242,411	110,860	81,639
Juniata Valley.....	64,348	29,858	10,055
Shenandoah Valley.....	276,674	126,028	152,199
Allegheny County.....	955,718	741,489	748,651
Miscellaneous bituminous.....	139,870	60,276	87,702
Charcoal.....	1,848	2,750	2,987
Ohio:			
Hanging Rock bituminous.....	46,631	25,814	22,200
Mahoning Valley.....	296,558	140,868	120,529
Hocking Valley.....	21,478	12,436	19,585
Miscellaneous bituminous.....	224,939	88,214	164,704
Hanging Rock charcoal.....	5,087	18,260	5,786

The production of Bessemer pig has been as follows:

Production of Bessemer Pig Iron.

States.	First half of 1893.	Second half of 1893.	First half of 1894.
New York.....	63,295	7,918	19,612
New Jersey.....	1,822	20	.....
Pennsylvania.....	1,489,154	894,076	995,321
Maryland.....	67,829	59,837	2,309
North Carolina.....	2,445	398	.....
West Virginia.....	66,298	15,193	23,932
Kentucky.....	15,846	2,895	.....
Ohio.....	282,108	139,091	236,146
Illinois.....	295,383	63,209	196,144
Missouri.....	22,329	10,031	892
Wisconsin.....	2,268	437	.....
Minnesota.....	10,373	3,498	24,236
Colorado.....	36,352	.....	.....
Totals.....	2,374,890	1,193,708	1,501,487

The production in the Pennsylvania and Ohio districts has been as follows:

Production of Bessemer Pig Iron in Pennsylvania and Ohio Districts.

	First half of 1893.	Second half of 1893.	First half of 1894.
Pennsylvania:			
Lehigh Valley.....	94,785	20,941	25,111
Schuylkill Valley.....	53,507	50,697	20,016
Upper Susquehanna Valley.....	64,033	25,136	46,301
Lower Susquehanna Valley.....	215,690	94,728	74,127
Shenango Valley.....	146,475	88,021	99,107
Allegheny County.....	702,201	578,754	676,449
Miscellaneous bituminous.....	122,454	35,799	54,210
Ohio:			
Mahoning Valley and Hanging Rock bituminous.....	80,576	40,595	56,677
Hocking Valley.....	18,803	12,070	19,585
Miscellaneous bituminous.....	187,727	86,426	159,884

The quantity of spiegeleisen and ferromanganese produced in the first half of 1893 was 47,976 gross tons; in the second half, 33,142 tons; total, 81,118 tons. In the first half of 1894 the quantity of spiegeleisen and ferromanganese produced amounted to 50,955 tons.

Unsold Stocks.

Concerning stocks, the report says:

The stocks of pig iron which were unsold in the hands of the makers or their agents on June 30, 1894, and which were not intended to be used by the manufacturers, amounted to 517,036 gross tons, in which figures are included a part of the stocks held in the yards of the American Pig Iron Storage Warrent Company, and which were under the control of the makers, the part in these yards not under their control amounting to 58,830 gross tons, which, added to the 517,036 tons above mentioned, makes a total of 575,866 gross tons of unsold pig iron which were on the market at that date.

Of the 517,036 tons of unsold pig iron which were under the control of the makers on June 30, 229,705 tons were charcoal pig iron. Another significant fact which is shown by our tables is the almost total absence of unsold stocks of pig iron on June 30 in the large producing districts of Allegheny County and the Shenango Valley, Pa., and the Mahoning Valley, Ohio.

The Chicgecto ship railway of Canada stands in peril of failure on account of the forfeiture of the Government subsidy of \$170,000 per annum for 20 years. The Dominion Parliament has been prorogued without the Administration bringing in the necessary legislation to extend the time for the completion of the work. The construction company represent that they have expended \$3,000,000 in the enterprise and that only \$1,500,000 more are required to complete it, which sum they can secure if the subsidy be not withdrawn. As the success of the undertaking is said to be contingent on the Government's aid, the scheme appears likely to be abortive unless private capital comes to the rescue.

The magnitude of the business transacted by the post office of New York City is illustrated in the report of Postmaster Dayton for the fiscal year ended June 30, 1894. During the year 455,191,631 pieces of ordinary mail matter were delivered besides 1,529,192 registered packages, while 940,944 of the latter were recorded and distributed to

other offices. The total number of pieces of mail matter handled during the year was 1,336,225,767, a daily average of 3,660,892, showing an increase over the previous year of 28,950,807. The volume of money order business was as follows: At the general post office, 1,346,628 money orders were issued and paid, amounting to \$10,058,163 54, and 844,941 postal notes, amounting to \$1,243,105.28. At the 40 branch post offices and sub-stations the number of orders issued and paid was 330,210, amounting to \$4,659,895 49; and the number of postal notes 155,268, amounting to \$295,613 79. The aggregate business of the money order department for the year amounted to \$103,355,487.83. The total receipts of the office were \$6,942,873 51, and the total expenditures \$2,791,951.05 (including \$1,218,785.28 expended for free delivery service), giving a net revenue of \$4,150,922.46.

Report on the Working of a Siemens Furnace.

The following report, which has been communicated to us by I. L. Stevenson, C.E., of Chicago, Ill., is of much interest as showing the operations in detail of the working of the furnace from the drying to the making of the different qualities of acid steel required. The experiments and tests were made at one of the largest steel works in England.

The furnace was 19 feet long by 10 feet 9 inches wide, internal dimensions, and the usual charge of 12 tons, when melted, was considerably below the level of the charging doors. The gas and air ports were 24 x 15 inches for air and 18 x 15 inches for gas ports. The passage for the gas from the generators, instead of being horizontal, sloped downward toward the center of the furnace at the rate of 1 $\frac{1}{2}$ inches to the foot, the roof sloping at the same angle to the center of the furnace.

Making the Hearth.—The fire for drying the brick work of the furnace was put in at 5 p.m. on June 28. The coal was simply placed on a number of 1 $\frac{1}{2}$ -inch square bars resting on supports fixed about a foot above the course of bricks forming the lowest part of the hearth. The fire consisted of about 300 pounds of coal, which was replenished from time to time until 9 a.m. July 5, a period of 7 days 14 hours. This preliminary fire serves the purpose of drying the roof and walls of the furnace only, there being no doors on during this time, the smoke escaping through the open doors of the furnace, the connection to the flue being closed by the damper. The ashes were raked out at 9 a.m. on July 5, and the furnace was allowed to stand until 9 a.m. on the following day, Sunday, when the gas was put in at the same time as in the other furnaces.

The heating up by gas was done in the usual manner—viz., reversing the current every half hour—and this was continued up to 9 a.m. on July 8. The interior of the furnace was then at a bright red heat, as the gas had been on two days, and the regenerators were also red hot.

The operation of making the hearth was then commenced as follows: A mixture of nearly equal quantities of loam and silica sands in the dry and uncalcined state was thrown in in small quantities at short intervals, about 2300 pounds in all being put in during a period of 27 hours. This mixture materially helped to fill up the crevices between the bricks and to form a sprink-

ling over the bottom. The sand in this preparation vitrifies and consolidates at a moderately low temperature, thus enabling the work of forming the bottom to be commenced sooner than would be the case if pure white sand were used alone. This was finished at 12 noon on the 19th, the temperature of the furnace having, of course, increased considerably in the meantime.

The mixture of sand was now altered to 3 parts silica sand with 1 part Belgian white sand, previously calcined in the sand furnace. It was thrown in in thin layers every 30 to 40 minutes, a new layer being thrown in when the preceding one had become vitrified. This mixture was continued until the end of the week, when the gas was turned off. The solidity of the bottom was repeatedly tried during this time by the furnaceman, who used a strong iron bar or stirring rod.

Gas was put in again on Sunday at 6.30 a.m., and the bottom was recommenced with the same mixture at 7.30 p.m., or 12 hours later. This was continued until 7 a.m. on Monday the 14th, the mixture having been used during a period of 3 days 14 hours. The proportion of sand was now changed to equal proportions of silica and white sand, and this applied in the same way for 24 hours until 7 a.m. on July 15.

The bottom being now finished it was washed out with 3 tons of melting furnace slag and 1 ton of hammer scale thrown in gradually at short intervals until 3.30 p.m., or eight and a half hours, until it was considered that there was sufficient slag in to wash the bottom out thoroughly.

The temperature of the furnace was kept up for an hour, and then the slag was rubbed about over the hearth, which absorbed it to such an extent that when the tapping hole was opened at 4.30 p.m. scarcely any slag remained; only about 50 to 60 pounds ran out at the tap hole and about 450 pounds was raked out through the doors of the furnace. Nearly the whole of the slag had soaked into the bottom.

The bottom was then dried with sand, repaired and fettled. This operation took a much longer time than usual, as there were some rather large holes in the hearth, but this of course may be expected when the hearth is new. The total time taken to dry and fettle the bottom ready for the first charge was 5 hours 10 minutes.

The weight of sand required for this important operation was 13 tons (of 2240 pounds), the shallowest part of the bottom being not more than 15 inches in depth to the first course of bricks.

The tapping hole is formed first by filling the aperture in the brick work with ganister from the inside of the furnace, the ganister being rammed against a plate temporarily fixed to the tapping hole casting on the outside. This operation is always done before gas is put in the furnace, and when the bottom is nearly finished a hole is cut through the ganister from the outside.

Below will be found a summary of the time occupied in the different operations in connection with making the hearth of this furnace:

	Days.	Hours.
Drying with coal fire.....	4	18
Furnace standing.....	1	..
Heating by gas.....	2	..
Heating up and using first mixture of sand.....	1	..
Heating up and using second mixture of sand.....	3	..
Furnace standing.....	15	..
Heating up.....	12	..
Heating and using second mixture of sand again.....	14	..
Heating up and using third mixture of sand.....	1	..

Washing out with slag and scale.....	8
Drying, repairing, fettling and hardening.....	5
Total time.....	14

The mixtures of sand above referred to are as follows:

First mixture, 1 part loam to 1 silica, uncalcined.
Second mixture, 1 part Belgian to 3 silica, calcined.
Third mixture, 1 part Belgian to 1 silica, calcined.

Working the first charge.—Steel required, rail quality.—The furnace having been flowed out as described in report on the formation of the hearth, and the necessary repairs, fettling, hardening, &c., having been completed, all was in readiness, and the furnace being at a good heat, the materials required for the cast were charged into the furnace, commencing 9.40 p.m. The charge consisted of:

	Pounds.
Pig iron (No. 1 Bessemer).....	11,200
Steel scrap (rail ends).....	6,720
Total metal charged.....	17,920

This charge is of course very much less than the full capacity of the furnace, but it is usual to work a small charge in the first instance, as well as of hard or rail quality steel, in order that as little injury as possible may be done to the bottom. A full charge or one for soft steel might do serious damage to a new hearth, and necessitate extensive repairs before another charge could be put into the furnace.

The furnace was charged with 8 tons of metal in about 35 minutes, a small quantity of gas passing through the furnace during this period. The furnace doors were then closed and the gas put on full until the flame became visible between the doors and the walls of the furnace, the screw of the gas valve being up from 6 to 7 inches and that of the air valve about 2 inches above its seat. This condition of the supply of gas and air was maintained throughout the working of the charge, the reversal of the current being made every half hour.

In the process of charging the pigs three fifth are distributed in a layer all over the bottom of the furnace. The steel scrap is then thrown in over the pig iron and the remainder of the pig iron is put on top of the steel scrap. This system is generally adopted in order to prevent the steel scrap from coming into contact with the bottom of the furnace, as it has been found to be very injurious, having a tendency to stick to the bottom and produce holes in it. The pig iron being on the top melts more readily and facilitates the fusion of the steel scrap immediately beneath.

The melting of this charge took place at 4 a.m., 6 hours 20 minutes from the commencement of charging, or 5 hours 45 minutes from the time the doors were closed; the perfect liquefaction of the metal being ascertained by rabbelling the charge with a 1 $\frac{1}{2}$ -inch soft steel bar or stirring rod. In this charge a quantity of Siemens slag and red bricks in about equal proportions were thrown into the furnace. Eight thousand pounds of the mixture was charged at 3.30 a.m., or about one-half hour before melting, and the remainder, 340 pounds, was put in five minutes before the charge melted.

The addition of ore (best selected hematite) was commenced at 4 a.m., about six or seven shovelfuls being thrown in at intervals of 10 to 15 minutes, until the metal began to boil, which in this particular charge took

place at 5.30 a.m., or one and a-half hours after the complete fusion.

The ore was then supplied in the same quantities, but at more frequent intervals, say every three or four minutes, the object being to keep the bath in a brisk state of ebullition. At 8 a.m. a sample of the metal in the bath was taken in the spoon and other samples at different intervals, but none of them were tried for carbon, as the appearance of the fracture at once showed that the steel was too hard for rail quality. At 9.25 a.m. a sample was again taken and the fracture had a very good appearance, free from honeycomb and crystallization. Slag samples were also taken, presenting a yellowish green color on the fracture. The carbon in the bath having become reduced to 0.26 per cent., it was decided to tap the metal out, but before doing so 112 pounds of pig iron was placed on the hearth just inside the door for about 15 minutes and then pushed into the bath, and 112 pounds of spiegeleisen containing 20 per cent. manganese was also heated to a red heat and thrown into the middle of the bath, which was rabbed to make the carbon as uniform as possible and to increase its percentage in the metal, as the charge was considered to have gone too far.

The metal was tapped out at 9.45 a.m., the following additions being made to it in the casting ladle:

Ferromanganese (80 per cent. Mn, 5 per cent. Si, 6 per cent. C), 151 pounds. Silicate manganese (20 per cent. Mn, 12 per cent. Si, 1½ per cent. C), 54 pounds.

The ferro and the silicide were thrown into the ladle as the metal ran in from the furnace.

The analysis of the finished metal was as follows: Carbon = 0.37 per cent. and Si = 0.06 per cent. The steel cast all right and the ingots rolled well.

The quantity of slag obtained was rather small, the bulk of it having been absorbed by the bottom; in fact, it was found necessary to add some bricks and slag to the second charge to form a slag.

The waste of metal in the first charge in a new furnace is always high, but no reliable estimate of the loss in this case can be made, as the pig iron and steel scrap charged into the furnace are estimated.

The different weights are as follows:

	Pounds.
Metal charged (estimated)	18,377
Ingots produced (weighed)	17,285
Loss	1,092
Per cent.	5.6

The bottom was considerably worn and required 2 hours 45 minutes to make it good for the next charge. The slag being thin no limestone was used. The length of time required to work the charge may be summarized as follows:

	Hours.	Minutes.
Charging pig iron and scrap..	35	
Melting	5	45
Oxidizing to boiling	1	30
Boiling	4	15
Total	12	5
Time occupied fettling hearth	2	45
Total time	14	50
Total materials used:		

	Pounds.	Pounds.
Pig iron	11,200	
Steel scrap	6,720	
Additions before tapping:		
Pig iron	112	
Spiriegel	112	
Additions after tapping:		
Ferromanganese (80 per cent. Mn, 5 per cent. Si, 6 per cent. C)	179	
Silicate manganese (20 per cent. Mn, 12 per cent. Si, 6 per cent. C)	54	
Slag and bricks	1,120	
Ore	1,680	
Limestone	Nil.	

Charge No. 2, for Rail Quality.—Description of Charge.

Description.	Weight. Tons. Cwt. Qrs.	Carbon. Cwt.	Silicon. Cwt.	Sulphur. Cwt.	Manganese. Cwt.
Pig iron, No. 1 Bessemer.....	3 0 0	2.16	1.71	0.042	0.270
Pig iron, No. 1 Bessemer...	3 3 0	2.23	1.10	0.080	0.409
Steel castings.....	1 0 0	0.07	0.084	0.010	0.120
Rail ends.....	3 0 0	0.21	0.042	0.042	0.600
Total weight.....	10 3 0	4.57	2.916	0.154	1.399
Per cent.....	Cwt. Qrs. Lbs.	2.241 %	1.436 %	0.076 %	0.69 %
Ferromanganese.....	2 0 0	0.120	0.010	Trace.	1.800
Per cent.....	0 2 12	0.06 %	0.005 %	Nil.	0.788 %
Silicide manganese.....	0 0 0	0.009	0.078	Trace.	0.122
Per cent.....	0 0 0	0.004 %	0.036 %	Nil.	0.060 %

Working of the charge:
 Commenced charging, 12.30 p.m.
 Finished charging, 1.30 p.m.
 Metal melted, 6.00 p.m.
 Metal boiling, 8.30 p.m.
 Metal tapped, 12.50 a.m.
 Duration of charge, 12 hours 20 minutes.

Analysis of gas used.	
CO ₂	3.90
O	0.58
CO	24.1
H	13.8
CN	0.87
N	56.75
Total.....	100.00

	Tons.	Cwt.	Qrs.
Ore used.....	5	0	0
Limestone.....	1	0	0
Analysis of steel made:			
Carbon.....			0.35 per cent.
Silicon.....			0.06 per cent.
Ingots produced (weighed).....	10	6	3
Carbon in bath before the addition of mixture, 0.30 per cent.			

Charge No. 15, for Tin Bar Quality.—Description of Charge.

Description.	Weight. Tons. Cwt. Qrs.	Carbon. Cwt.	Silicon. Cwt.	Sulphur. Cwt.	Manganese. Cwt.
Pig iron.....	7 0 0	4.99	2.80	0.119	0.770
Steel castings.....	1 0 0	0.07	0.07	0.012	0.080
Ingot ends.....	4 0 0	0.28	0.056	0.048	0.560
Total weight.....	12 0 0	5.24	2.926	0.179	1.310
Per cent.....	Cwt. Qrs. Lbs.	2.22 %	1.219 %	0.074 %	0.542 %
Ferromanganese.....	1 2 20	0.101	0.008	Trace.	1.304
Per cent.....	0.042 %	0.003 %	Nil.	0.56 %	

Working of the charge:
 Finished charging at 10.20 a.m.
 Metal melted, 2 p.m.
 Metal boiling, 3.30 p.m.
 Metal tapped, 7.50 p.m.
 Total time, 9 hours 30 minutes.

Analysis of gas used.	
Pure gas.	Waste gas.
CO ₂	4.5
O	0.4
CO	26.2
H	11.5
CN	1.4
N	56.0
Totals.....	100.00
	100.00

	Tons.	Cwt.	Qrs.
Ore used.....	1	15	0
Limestone used.....	1	2	0
Analysis of steel made:			
Carbon.....			0.12 per cent.
Silicon.....			0.01 per cent.
Ingots produced (weighed).....	13	14	3
Carbon in bath before the addition of mixture, 0.09 per cent.			

Charge No. 16, for Castings.—Description of Charge.

Description.	Weight. Tons. Cwt. Qrs.	Carbon. Cwt.	Silicon. Cwt.	Sulphur. Cwt.	Manganese. Cwt.
Pig iron.....	6 4 0	4.476	3.534	0.086	0.588
Ingot ends.....	4 0 0	0.280	0.056	0.048	0.560
Tin bar scrap.....	0 10 0	0.010	Trace.	0.006	0.085
Total weight	10 14 0	4.766	3.590	0.140	1.153
Per cent	Cwt. Qrs. Lbs.	2.227 %	1.681 %	0.086 %	0.539 %
Ferromanganese.....	2 2 0	0.150	0.012	Trace.	2.00
Per cent	0.070 %	0.008 %	Nil.	0.935 %	
Silicide manganese.....	4 2 0	0.067	0.540	Trace.	0.900
Per cent	0.082 %	0.252 %	Nil.	0.421 %	

	Tons.	Cwt.	Qrs.
Castings produced (estimated)	9	0	0
Ingots (weighed)	1	13	2
Total produced	10	13	2
Loss.....			3.6 per cent.

A Large Engine Contract.

Fraser & Chalmers of Chicago are now at work on an important contract for engines to be used in the street car service of that city. The West Chicago Street Railroad Company propose to convert a number of their horse car lines into electric lines. At present a part of the system is operated by cable and the remainder by horses. The cable lines will, of course, be continued, but the horses are to be abandoned as rapidly as possible for the trolley. Enormous power will be required for the electric service.

The work now being done by Fraser & Chalmers comprises four 24 and 40 x 48 inch twin compound condensing engines. The plant will ultimately consist of eight engines of this size and one smaller size high speed engine. Each of the compound engines is rated at 1000 horse-power, but their economical horse-power is 640. The eight will easily work up to 6000 horse-power. These engines have independent air pumps and condensers. They are to be piped so as to run condensing or non-condensing and so that one engine can be run using the condenser of another engine. They will have a frame specially designed by the engineering department of the street railroad company. The generators will be placed on the engine shafts. Both the high and low pressure cylinders will be provided with a new valve gear invented by E. T. Sederholm, chief engineer of Fraser & Chalmers, which will cut off from nothing to about eight-tenths.

The same firm are also building ten 300 horse-power boilers of the Campbell & Zell type, each having 3000 square feet of heating surface. They also furnish two Jewell filters with a combined capacity of 25,000 gallons. The boilers will be designed to work under a pressure of 160 pounds and will be equipped with the Murphy stoker. The feed pumps will be of the Admiralty type. Westinghouse, Church, Kerr & Co.'s steam drip system will be used for draining all pipes. The entire power contract has been taken by Fraser & Chalmers, with the exception of the dynamos and other electric appliances, which are to be furnished by the Siemens & Halske Company of Chicago. The four engines are to be ready for delivery by November 1, and will then be installed in a station which is now being erected at California avenue and the North branch of the Chicago River. The power there generated will be used for the street car lines extending over the Northwestern part of the city and perhaps for a portion of the system of the North Chicago Street Railroad Company, whose horse car lines are also being converted into electric lines.

At Pittsburgh last week a motion for a preliminary injunction was argued in the United States Circuit Court in the case of the Columbia Wire Company of Chicago against the Pittsburgh Wire Company of Pittsburgh. It is stated that the last named concern have infringed on certain barb wire patents belonging to the Columbia Wire Company.

The tide of emigration from the port of New York this season is very strong, and it has been stimulated during the past two weeks by the heavy cuts in steerage passage rates made by nearly all the transatlantic lines. All the steam-

ers bound for Europe are leaving with a full tale of passengers, while immigration is 33 per cent. below the average. A similar condition of things is said to prevail on the steamers of the Philadelphia and Boston lines.

Apparatus for Breaking Pig Iron.

BY JOHN S. KENNEDY, CHAMBERSBURG, PA.

The possibility of handling an entire cast cold was impressed upon me in

It is not necessary to locate the breaking plant in the cast house, as it may be central to a group of two or more furnaces, in which case the beds would be loaded on trucks after having been carried to the end of the cast house, conveyed to a stationary crane at the breaking plant, and there lowered on the table.

Fig. 1 is a sectional view of a cast house, showing two beds suspended from an overhead traveling crane, one of such beds being in a vertical plane, in which position the bed can be readily cooled and the sand washed off; the other is shown suspended in a horizon-

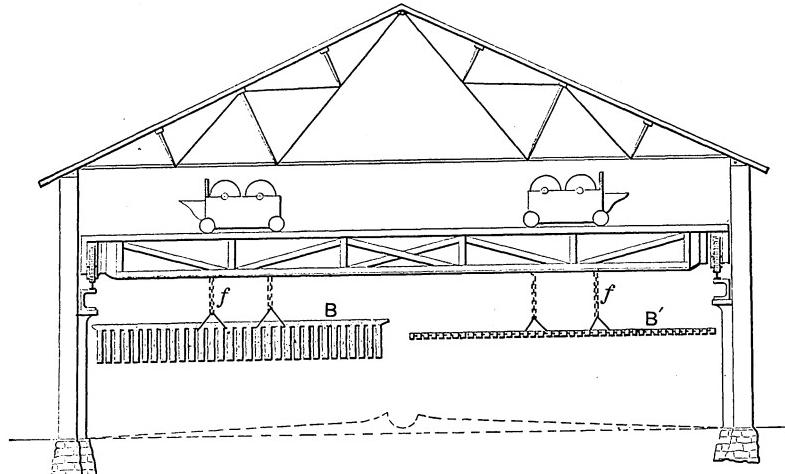


Fig. 1.—Sectional View of Cast House.

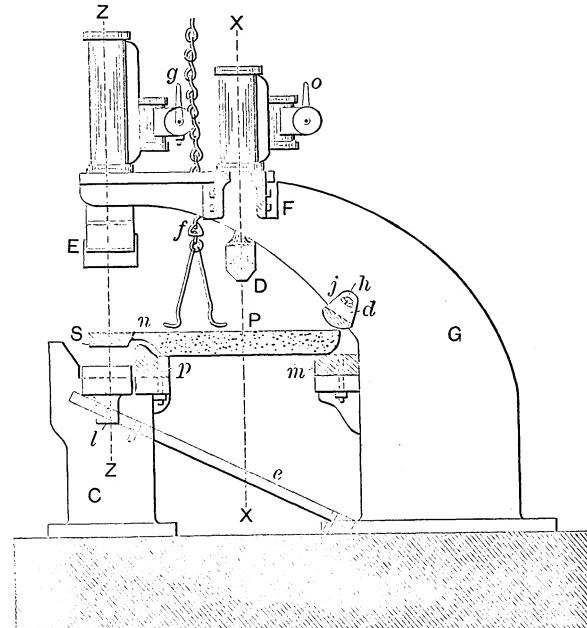


Fig. 3.—Sectional View of Breaking Table.

THE KENNEDY APPARATUS FOR BREAKING PIG IRON.

Alabama, where it is the general practice to break all the iron cold. In order to do this the sow is cast wide and thin, and the necks of the pigs are reduced to a small section where they join the sow; this arrangement renders the breaking of the beds easier and gives a minimum of sow iron. To lift a bed of iron and traverse it to a breaking table is not in itself difficult, but to design an apparatus which would break the bed in a suitable manner, introduces some intricate problems. A bed of pig iron, with the pigs attached to the sow, is an unwieldy mass to handle, and for this reason it seems best to avoid any movement of the bed after it is placed upon the breaking table.

tal plane, in position to be traversed to the breaking table. The traveling crane and trolley can be operated by any of the approved systems in common use, such as electricity or rope transmission, and this point will not be discussed further at present.

Fig. 2 shows an elevation of the breaking table, designed for a 24 foot bed, and Fig. 3 is a sectional view of the same. From an inspection of Fig. 3 it will be seen that when the bed, comprising the sow and pigs, is placed upon the supports 'p' and 'm' of the table, the sow 'S' will overhang or project outside of the support 'p'. Directly beneath the sow, but 4 inches below the plane of the support or anvil plate 'p', is a series

of anvils, *l*, which form, as it were, a secondary table to support the sow *S* after being broken off from the pigs. The breaking table will be seen to consist of five housings, *G*, and seven short standards. The housings *G* carry the vertical steam cylinders operating the sow hammers *E* and the pig hammers *D*, as well as supporting the anvil plate *m*. The short standards *C* support the

key has considerable play before engaging the clamps *d*. This allows for any irregularity in the thickness of the bed. A grating shown in section at *e*, Fig. 3, and partly in elevation at *e*, Fig. 2, serves to carry the broken metal beyond the housings, and also acts as a sand screen.

It will be noted that the pig hammers *D* are of sufficient length to strike

provided with heavy V shaped guides *i* passing through sleeves *k* bolted to the housings.

Fig. 3 represents a bed lowered on the breaking table. The carrying chains *f*, which enter between the prolongation of the housings *G* as far as the cross guides *F*, are cast off. The bed is resting on the anvil plates *m* and *p* and the clamps *d* are rotated so as to secure the ends of the pigs *P*. It will be seen that the section of the bed shows a thin wide sow and that the necks of the pigs are reduced to a small area. The projecting shoulder *n* of the anvil plate *p* is made somewhat smaller than the reduced section of the pig at the necks calls for, in order to allow for irregularities in castings.

The action of the apparatus is as follows: If the iron is strong—*i. e.*, difficult to break—the pig hammers *D* are lowered until they rest on the centers of the pigs. The sow hammers *E* are then caused to strike the overhanging sow *S* simultaneously. The shoulder *n* forms a point of rotation, and the cross section of the necks being less than the area of the sow, the sow is broken bodily from the pigs and driven down upon the anvils or secondary tables *l*. But the stroke of the sow hammers permits their downward movement to continue, the hammer dies passing between the anvils *l*, thus breaking the detached sow into short lengths. The elevation of one of the sow hammers at *E*, Fig. 2, shows the operation of breaking the sow. The detached pigs still remain upon the anvil plates *m* and *p*, held by the clamps *d*. They are struck simultaneously by the pig hammers *D* at their centers. Should the iron prove easily broken, the sow and pig hammers may be made to strike the bed simultaneously, shortening the operation. Should the bed to be broken be "sheeted" or "plated," the sheeted portion may be struck any number of blows by the proper hammers, while the bed is held securely upon the table by the remaining hammers.

The hammers described are designed to be operated by steam and cushioned. They can be operated independently or interlocked so as to move simultaneously. The valve motion and cushioning device will be illustrated in a future number of *The Iron Age*.

I claim that this method of carrying out and breaking iron will be found cheaper and quicker than the present practice; that it will reduce the labor cost per ton of iron, lighten the work of the furnace men, effect a saving in scrap and sandage as well as giving a cleaner fracture to the iron.

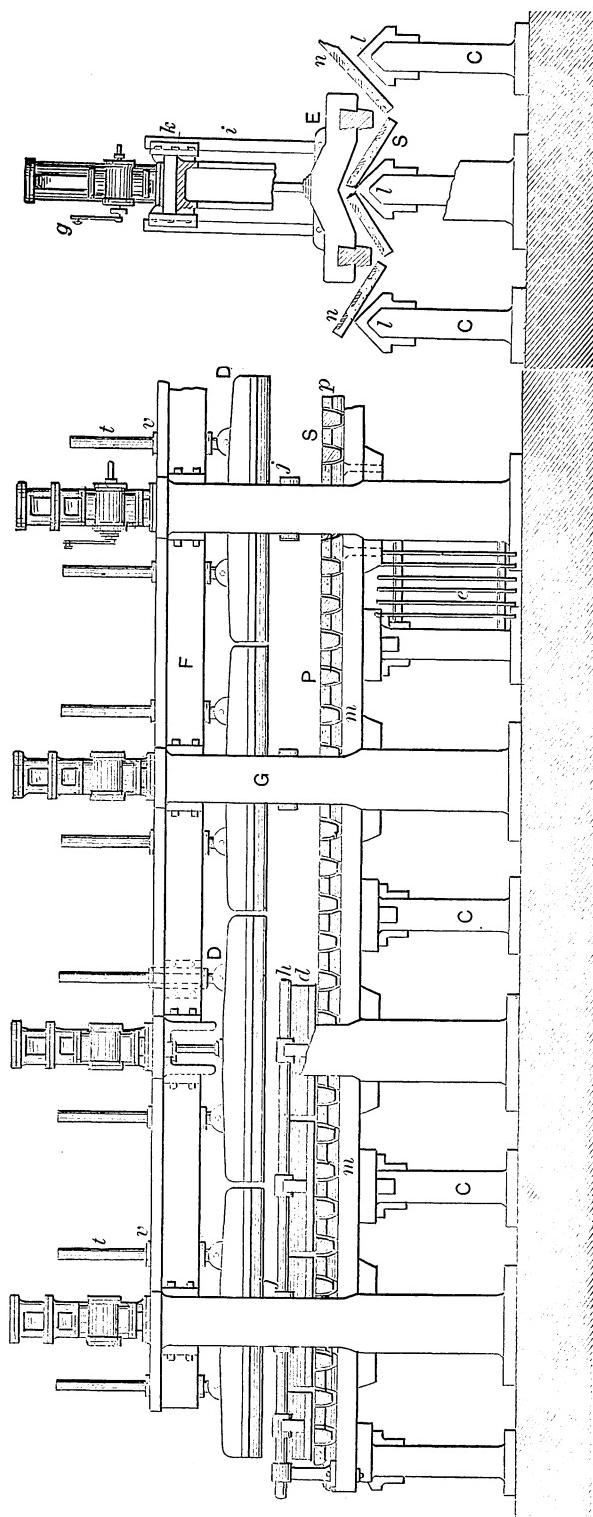


Fig. 2.—Elevation of Breaking Table.

THE KENNEDY APPARATUS FOR BREAKING PIG IRON.

sow anvil plate *p* and the secondary anvils *l*. The two end standards *C* are extended, not shown on the drawing, so as to support the projecting ends of the anvil plate *m*. A heavy shaft, *h*, journaled in boxes in the housings *G*, carries the dogs or clamps *d*, which may be used to secure the bed to the table, should it be necessary. A cross section of these dogs is shown in Fig. 3, where it will be noted that the shaft

seven or eight pigs at their centers, when the bed is supported on the table. These pig hammers are provided with heavy round guides *t* moving through sleeves held by the cross girders *F*. The sow hammers *E*, one of which is shown in elevation in Fig. 2, are provided with two hammer dies projecting 4 inches beyond the bottom plane of the hammer, and placed at right angles to its length. These sow hammers are

The Neafie & Levy Company of Philadelphia have just completed the last of an order for four steel steam vessels for Juan J. Menendez of Cuba. The new vessel, the "Purisima Concepcion," is 244 feet long and 35 feet beam, with 24 feet depth of hold. She is a twin screw with a calculated speed of 14 knots per hour. The "Purisima Concepcion," like her sister vessels built at Philadelphia, is destined to carry mails and passengers between Havana, Cienfuegos and Santiago de Cuba. This is the 879th craft turned out from the Neafie & Levy yards.

The question of garbage disposal is being actively canvassed in New York City. The present method of dumping refuse in the sea is greatly complained of by seaside residents. Practical sanitarians are urging the use of crematories.

Western Foundrymen's Association.

The regular monthly meeting of the Western Foundrymen's Association was held Wednesday evening, July 25, at 702 Western Union Building, Chicago, with President George M. Sargent in the chair, and B. M. Gardner secretary. Among those present were the following: Geo. M. Sargent, The Sargent Company, Chicago; A. W. McArthur, Rockford Foundry Company, Rockford, Ill.; William Francis, the King & Andrews Company, Chicago; Thomas Snow, Challenge Wind Mill & Feed Mill Company, Batavia, Ill.; L. L. Trowbridge, Wells & French Company, Chicago; T. A. Wigham, Chicago; F. B. Whitcomb, Chicago; W. L. Lukens, Illinois Malleable Iron Company, Chicago; W. T. Warner, Illinois Central shops, Chicago; J. Welch, Weir & Craig, Chicago; O. T. Stantial, Illinois Malleable Iron Company, Chicago; W. Leahy, Wells & French Company, Chicago; H. L. Hotchkiss, William Deering & Co., Chicago; S. T. Johnston, Whiting Foundry Equipment Company, Harvey, Ill.; Eugene W. Smith, Crane Company, Chicago.

O. T. Stantial, chairman of the Test Bar Committee appointed at the last meeting, reported that the committee are still working, and expect to be able to report at the next meeting.

The following resolution, as presented at the last meeting of the association, came up for action:

Resolved, That Article IV of the by-laws be amended to read as follows: Article IV. The dues of the association shall be an admission fee of \$5 and \$10 per annum, paid quarterly, in advance.

After considerable discussion the resolution was passed.

The following resolution, as presented at the last meeting of the association, came up for action:

Resolved, That Article I of the by-laws be amended to read as follows: Article I. The regular meetings of the association shall be held bi-monthly, at such time and place as the Executive Committee may elect. Twelve members shall constitute a quorum.

After discussion the resolution came to a vote and was defeated. The secretary then read the paper of the evening, as follows:

An Economical Cupola.

BY F. B. WHITCOMB.

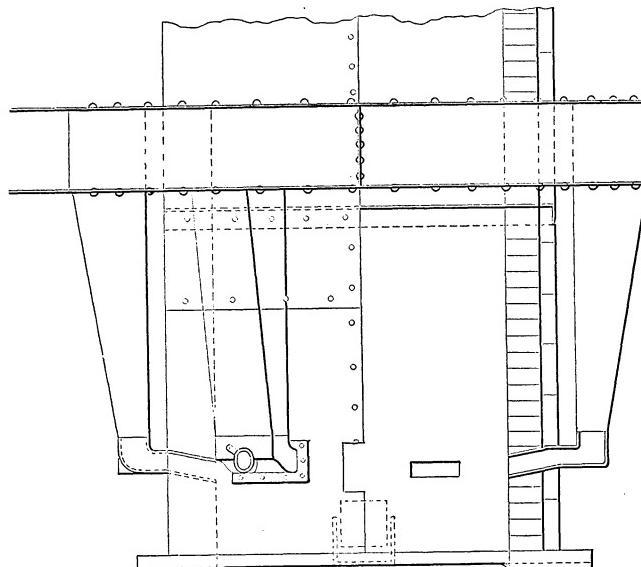
At the May meeting of the Western Foundrymen's Association a letter from the writer was read in which was given a short description of the workings of a cupola erected under my directions, at Beloit, Wis., for the Eclipse Wind Engine Company. The cupola was built in 1885, and when first lined was bricked up to 40 inches, but as the heats increased in size the brick was carried up to 45 inches. For blast a No. 6 Sturtevant fan was used, placed about 12 feet from the cupola. The air pipe ran straight through to the air chamber around the cupola, and was considerably larger than the outlet of the fan. The air chamber was several feet above the tuyeres, and the pipes running from the air chamber to the tuyeres were 11 x 10 inches at the first point, and graduated down to 5 x 10 inches at the tuyeres. The tuyeres were four in number, 2 1/2 x 9 inches, the longest way horizontal. The tuyere on the right hand and in front was placed 13 inches above the bottom of the cupola, and the other three 13 1/2 inches above, so

that the man that tapped out could watch the lower tuyeres should at any time the iron be near it. In running through the lining the tuyeres were inclined a little toward the bottom. The cupola was 10 feet 6 inches long from the bottom to the bottom of charging door, and the slag was about 1 1/2 inches below the tuyeres. I superintended this foundry for four years and a half, and ran the cupola for a little over three years of this time. The heats varied from 4 to 16 tons, and during one year of the time I was in charge the average melting for the year was 11 1/2 pounds of iron to 1 pound of coke. The best melting for a single heat in that time was 14 to 1. The work done was in wind mill castings, pulleys and engine castings—from light snap work to castings weighing more than 5 tons. There was no indicator attached to tell the blast used.

I do not think we can use the same amount of blast pressure on all cupolas. Take, for instance, the cupola described

particular to get the coke as even as possible. If there is any difference, I favor the sides instead of the center with the most coke. I am satisfied that in many foundries more coke is used than is necessary. Where too much coke is used, iron will not melt as fast, and to melt iron with little coke, it must be done quickly. Use enough to make the iron hot, and after that is done every pound added does more harm than good.

In conclusion I will state that the best feature of this cupola was in the free way it received the blast. From the experience I have had and were I to put up another, I would make a change in the tuyeres, making them 2 x 12 inches instead of 2 1/2 x 9 inches, to give more space around the side for the air to enter and be distributed inside more equally. For larger cupolas than the one I have described I would use six tuyeres instead of four. It is better, also, to have a little more blast than is necessary than not to have enough; for



THE WHITCOMB CUPOLA.

above, with air pipe and tuyeres larger than are used generally. They will let the air escape freely, and show less pressure on an indicator than a cupola with less tuyere surface that would confine the air more. Light coke does not require as much blast as heavy coke. I have used but two kinds of American coke that I could rely upon: Connellsburg and New River. Connellsburg is heavier than New River and will stand more blast. I used English coke one year in San Francisco, and found it to be a good deal like New River, and an excellent fuel.

My 4-ton heats usually took 40 minutes to melt from the time the blast went on until the bottom was dropped. The larger heats ran about 7 1/2 tons an hour. The iron would commence to melt in about six or seven minutes after the blast went on. For the bed, I filled to 23 or 24 inches above the tuyeres with coke, then put on 2500 pounds of iron. The balance of the charge was from six to seven shovels of coke to about 1200 pounds of iron. The cupola was fired about 1 1/2 hours before the blast went on. In heating, when the fire was started, coke was put in to cover above the tuyeres, and when that was fired through the balance of the bed was put in and charged until the cupola was full. In charging, I am always very

it is always easy to shut off some while it is hard to increase it.

Discussion.

Mr. Sargent: This is the kind of cupola that has given you the best results, is it not?

Mr. Whitcomb: Yes, for the same amount of fuel.

Mr. Sargent: I would like to ask, for information, how much iron should be melted to the pound of coke as a usual thing in good cupolas?

Mr. Stantial: That is according to the heat. In ordinary practice from 1 to 8 or 1 to 9 is fair. I have known cases where it has been 1 to 13 1/2.

Mr. Whitcomb: Almost every heat will vary a little.

Mr. Stantial: The ordinary foundry would be 8 to 1. Was your coke weighed?

Mr. Whitcomb: Yes. The iron was weighed also.

Mr. Stantial: The average charge was 10 tons?

Mr. Whitcomb: Yes, I guess it would average 10 tons. Some heats would run as low as 4 tons, and 16 was the largest.

Mr. Francis: If more tuyere surface was advisable, would you not take more tuyeres rather than enlarge the ones you have?

Mr. Whitcomb: The results would be the same if there were more tuyeres, but it is a little easier to make less tuyeres. Four tuyeres for a cupola of that size I think are about right.

Mr. Francis: Is there any advantage in having the draft pipe above the tuyeres?

Mr. Whitcomb: I do not know exactly how high that pipe was.

Mr. Francis: In the engraving it looks very high.

Mr. Whitcomb: That was to get away from the slag on the back side. I think that the pipe was 3 feet above the tuyeres.

Mr. Whitcomb: I have built several cupolas and I have enlarged the tuyeres, and every time that I have done it I have found that I have made a point by doing so.

Mr. Stantial: I like the lower tuyeres. I do not believe in upper tuyeres at all, although we use them now. We use them because they happen to be there.

Mr. Warner: The furnace I use has a continuous tuyere inside. It is an old one, I think a Mackenzie. I have never experimented as to what I could do, but I shall try now. I melt about 1 to 9.

Mr. Wigham: You make the assertion that you could run more tuyeres on a similar sized cupola, Mr. Whitcomb?

Mr. Whitcomb: On a larger sized cupola.

Mr. Smith: Mr. Whitcomb explains that he used from six to seven shovels of coke to 1200 pounds of iron. I would like to ask him how he weighs the coke.

Mr. Whitcomb: All the coke that is taken on to the scaffold was weighed and what was not used was weighed back.

Mr. Smith: It looks to me that six or seven shovels of coke is a very thin layer to put between 1200 pounds of iron. It is a question whether it is advisable to economize so much on fuel to melt 15 to 1, and to lose in other directions.

Mr. Leahy: My experience has been with a patent cupola, and our average melting is about 10 to 1. We use the Colliau cupola.

Mr. Snow: What is your average melt?

Mr. Leahy: About 60 tons.

Mr. Hotchkiss: We have the Colliau cupola, and we melt about 70 or 80 tons a day. We are melting to-day 13 to 1. We have melted 14 to 1, and run weeks at that. With 20-ton heats we would probably run from 12 to 13.

Mr. McArthur: We use the Colliau cupola and melt about 17 tons. Now we are running about 5 or 6 tons daily. I count myself very lucky with small heats if I get 5½ to 6. On large heats I am well satisfied with 10, even 9. We use Connellsville coke. I do not see how we can set any average that will do for all men and all foundries. My work runs from pieces that weigh ½ pound to castings that weigh 6 or 8 tons in the same heat. I will say on an average run from 12 to 16 tons, 1 to 10 would be all I would expect or ask for. I would like to ask Mr. Whitcomb what his object was in inclining the tuyeres down.

Mr. Whitcomb: To keep the blast to the bottom. The higher the tuyeres are the more coke you have to burn. There is more burning surface. The fan was placed on top of the core oven. The core oven was 8 or 9 feet high, and that would bring the fan up probably 10 feet and the blast pipe was inclined right down until it came to the air chamber.

Mr. Stantial: If I am not mistaken, in our cupola melting from 13 to 14, the fan is from 400 to 500 feet from the cupola.

Mr. Snow: It is only a question of power.

Mr. Whitcomb: I have always been pretty strongly impressed that the nearer the fan is the better.

A vote of thanks was extended to Mr. Whitcomb for his paper, after which the meeting adjourned.

The Production of Bessemer Ingots and Rails.

The *Bulletin* of the American Iron and Steel Association publishes the following table, which gives the production of Bessemer steel ingots in the first half of 1894, compared with the first and second half of 1893:

States— Ingots.	First half 1893. Gross tons.	Second half 1893. Gross tons.	Total 1893. Gross tons.	First half 1894. Gross tons.
Pennsyl- vania...	1,337,079	789,141	2,126,220	1,129,559
Illinois....	220,059	94,770	314,829	252,080
Ohio.....	232,980	115,161	348,141	171,048
Other States..	301,939	124,557	426,496	114,767
Totals	2,092,057	1,128,629	3,215,686	1,867,454

The following table gives the production of Bessemer steel rails of all weights and sections, including street rails, in the first half of 1894, compared with the first half and second half of 1893. In this statement is not included street and other Bessemer rails which were rolled from purchased blooms in any of the half years mentioned:

States— Rails.	First half 1893. Gross tons.	Second half 1893. Gross tons.	Total 1893. Gross tons.	First half 1894. Gross tons.
Pennsyl- vania...	429,059	210,372	639,431	284,061
Illinois....	170,263	61,997	232,260	95,955
Other States..	104,918	59,744	164,662	19,388
Totals.....	704,240	332,113	1,036,353	399,404

The great decline in the production of both Bessemer steel ingots and rails in the 12 months beginning with July 1, 1893, is shown by a comparison of this production with that of the first six months of 1893. In these six months we produced 2,092,057 gross tons of ingots and 704,240 gross tons of rails; in the last 12 months we produced 2,791,083 tons of ingots and 731,517 tons of rails. In no year since 1879 have we made so few steel rails as in the last 12 months.

Work is progressing actively on the building for the new tin house to be attached to the rolling mill of the Lalane & Grosjean Mfg. Company, at Harrisburg, Pa. Orders have been placed for the necessary tinning machinery and for cleaning and dusting machines, &c. These will be ready to be installed as soon as the building is completed. Six tinning sets will be placed in operation as a commencement, and space will be provided for ten more pots, which will be added later. It is the intention of the firm to make this a complete modern tin plate plant, possessing all the latest

improvements in the way of labor saving machinery. They expect to be in shape for making tin plate about September 15.

San Francisco News.

The crop outlook has been improving every day. In the northern portion of the State especially many sections show as high as 20 sacks of wheat to the acre and 150 pounds to the sack, where in ordinary years they do not show over 16 sacks to the acre and 130 pounds to the sack. This goes a long way to make up for low prices and to promote the general prosperity and I confidently look for better times. As regards the past half year there is some slight difference of opinion among merchants in these lines, arising doubtless from their varying personal experience. The head of one of the largest houses on the coast takes a more roseate view of things than do many of his business colleagues. He thinks that outside of the period covered by the railroad boycott the conditions of trade for the year in hardware were fairly satisfactory. Collections though not up to a satisfactory standard were comparatively fair and money comparatively easy in the country. He says that the failure of crops in some of the largest valleys in the State prevented the general tone of the hardware trade from being as active as that of the first six months of 1893, which, considering the general character of business in that year, were undoubtedly good. The after effects of the strike had their influence on trade and had, he thinks, only one good result in that they kept Eastern jobbers from making an aggressive fight for the trade such as it was. The long spell of dry weather that we had early in the season, in his opinion, curtailed the sales of agricultural implements a good deal. There is comparatively little grain being cut in those sections where larger agricultural machinery is generally used, and its sale has been restricted in other directions also, owing to the fact that a good deal of grain had been cut for hay. A large number of the smaller agricultural machines had, however, been sold in those sections. The panic and the shortage of crops had, he thought, the effect of confining the operations of certain so called jobbers more strictly to the retail trade and had confined the wholesale trade more generally to the larger jobbing houses of the coast. Of course, one effect of this would be to secure better prices for the old standbys, as they are sometimes called. He concludes that as a general thing the agricultural implement business has been decidedly off for the first half of the year, while the hardware business has held its own. The cheap railroad and sail freights had enabled the San Francisco jobber to reach more distant points than he could reach for many years. It was true that the volume of this distant business had not reached large proportions, owing to the great depression that existed everywhere. With a revival of the old conditions an increase of this particular trade could be looked for, provided that merchandise could be laid down as cheaply in San Francisco as it can now. He thought, however, that the agricultural implement business, as it is now handled, was hardly capable of a like extension, the system of agencies tending to confine jobbers to smaller territories around the great centers of trade. The jobbers themselves have aided this curtailment,

as they have not for many years asked of Eastern manufacturers more territory than that in which they now trade. This condition of affairs could hardly be destined to be permanent, as the heavy capitalization of the leading Pacific Coast houses would force them to do a larger volume of business than their present limited territory would permit. They would be obliged to take in such territory as the freight rates and credits would justify. This gentleman is himself a large manufacturer of agricultural implements and doubtless has an eye on Oregon and Washington as promising fields for their sale.

Coal Mining in Illinois.

The twelfth annual report of the statistics of coal in Illinois has just been issued by the State Bureau of Labor Statistics for the year ended July 1, 1893. The output was the largest ever reported for that State, showing an increase of more than 2,000,000 tons over the previous year. Among the most important items of information are those concerning the working of the gross weight law, the payment of wages, the location, number and rules regarding truck stores, the number of men working above and below ground, the cost of mining material, and other facts bearing directly on the production of coal.

The report shows that coal was mined during the year in 56 counties from 788 openings. The total number of net tons mined was 19,949,564, of which 16,112,899 was lump coal, and 3,838,665 other grades. The number of acres worked out was 3109, and the total number of employees was 35,390, of whom 26,145 were miners. The remaining 9245 include boys, of whom 854 boys over 14 years of age worked under ground and 3806 above. The average number of days of active operations at mines was 229.4.

The aggregate home value of the total product was \$17,827,595, the average value per ton at the mines being \$1.025 for lump and \$0.5427 for other grades. The average price per ton for hand mining was \$0.7145, being \$0.6734 for summer and \$0.722 for winter. The number of tons of lump coal mined by hand was 8,146,646, of which 1,775,211 tons were paid for by the day and 5,961,289 tons paid for by gross weight. The number of tons mined by machines was 4,729,749. The number of kegs of powder used, 353,772.

During the year 69 men were killed, making 32 women widows and 106 children fatherless. There were 403 men injured so as to lose time. This shows that 289,124 tons of coal were mined for each life lost, and 49,502 tons for each man injured. The number of lives lost was 1 in every 518 employees, and 1 man in every 88 was injured.

Seventy new mines were opened and 120 closed or abandoned. There has been a marked decrease in the number of mining places during the last four years, with a distinct gain in the output. This year shows a decrease in the number of mines of 51, although the product increases 2,087,288 tons.

Notwithstanding the number of mining places is 148 less than in 1890, the output of coal is over 4,500,000 tons in excess of that year, and seems to point conclusively to the abandonment of smaller mines as unprofitable, and to the concentration of the business to the larger and improved class of plants.

The average value of lump coal, \$1.03 per ton, is a trifle below that of the year previous, and the price paid for hand mining, computed on screened tons, 71.45 cents, is practically on a level with that of the year previous. The number of employees has increased 1758, and the number of days of active operation was greater than any year for the decade. The mining of coal by machines is rapidly increasing, the number of machines employed being ten more than last year, and the increase in tonnage as mined 836,460. While the number of men killed exceeds that of any other year, with the exception of 1883, the actual ratio of the fatalities to the number of employees and the number of tons mined is smaller than any year except 1886. The year 1893 was one of marked activity and unusual prosperity in the coal industry, and these figures will be of great interest as a basis of comparison when the record for the troublous year of 1894 shall be made up.

The report shows that 38 truck stores are yet maintained by companies or firms operating coal mines. These are located in four districts, there being none in the fourth district. Several companies compelled their employees to take out accident insurance policies, and deducted the premium from their wages.

An exhaustive report is given of the mining exhibits at the World's Fair.

THE WEEK.

The Bank of England celebrated its two hundredth anniversary on July 27. The charter of incorporation was granted in 1694 by William and Mary.

The Southern Railway has set aside a separate fund for the promotion of small industries along the several lines embraced in the new system.

The strike of the iron miners on the Gogebic range was declared off on Saturday, after an idleness of six weeks.

Forest fires in Northern Wisconsin have wiped out several towns and inflicted damage amounting to some millions of dollars. New Jersey and Washington State have also been visited by several forest fires within the past two weeks.

It is said that the New Zealand Government intend to make reductions in the tariff on iron and building materials, as well as on the necessities of life.

The republic of Paraguay is desirous of concluding a treaty with the United States similar to the treaty now existing between Brazil and this country.

Mr. Siemens, the London electrician, has submitted an offer to the Dominion of Canada for laying a cable under the Pacific Ocean, from Victoria, B. C., to Sydney, New South Wales. He undertakes to complete the construction within three years and offers to lay the cable for a sum of \$10,000,000.

At a meeting in Buffalo last week the canal boat owners adopted a resolution not to handle wheat under the uniform rate of 3½ cents and other grain in proportion. They claim that at present freight rates there is nothing in the business for them.

The June report of the Philadelphia & Reading Coal and Iron Company makes a better showing than has been the case for some time. The gross receipts are given as \$2,348,983, and

profit from mining \$211,741, against operating expenses, improvements, &c., amounting to \$2,137,243. Deducting fixed charges, there is a surplus for the month of \$89,532, against a deficit of \$93,132 in June, 1893. The seven months of the current fiscal year show, however, a deficit of \$952,343, against a deficit in the corresponding period of last year of \$706,189.

At a meeting of the Eastern and Western anthracite coal agents in New York City last week it was decided to limit the output for August to 2,500,000 tons and to maintain the present prices.

The Anglo-American Telegraph Company's new cable was laid in 12 days, the shortest time on record for such an operation. The steamship "Scotia," which started from Heart's Content, Newfoundland, on July 15, laid the deep sea section, and the "Britannia" the Irish shore section, a short one of 192 knots in length. The final splice was made on July 27. The whole operation was probably the most successful feat of cable laying ever accomplished, considering the size of the cable, which is the heaviest yet stretched under the Atlantic. The new cable is laid between Valentia, Ireland, and Heart's Content, Newfoundland. It contains 600 pounds of copper to the nautical mile, and has a larger conductor than any cable ever laid, which means a greater capacity and higher speed of transmission than any of the lay cables.

The war cloud in the far East is assuming a very threatening aspect. Hostilities have already begun between Japan and China, although no formal declaration of war has yet been made. It is possible that the quarrel over Corea may lead to international complications if the question is not settled by European intervention. The Chinese Government is said to have placed orders with merchants in the China trade for the supply of torpedo boats, fast steamers, heavy guns and about 400,000 Mannlicher rifles, together with a vast amount of ammunition. The outbreak is likely to interfere seriously with the export trade. San Francisco advises mention that steamers are loading with provisions for China at that port, but only at the owners' risk.

Key West, Fla., will, in future, be a coaling station for the vessels of the North Atlantic and Caribbean Sea fleet. Hitherto the Navy Department has ordered vessels cruising in the Caribbean Sea to coal either at Jamaica, Cartagena or Colon, where the price of bituminous coal ranges from \$9 to \$11 a ton. The same coal can, it is claimed, be put on board at Key West at a little over \$4. The saving will, therefore, be considerable.

According to the Baltimore *Journal of Commerce*, it appears that not one American steamship has been loaded at that port during the last four years. In connection with this fact the *Journal* remarks that in 1860 upward of 66 per cent. of the export and import trade of the United States was carried in American vessels, while in 1893 that quantity was reduced to less than 12 per cent. Statements of the value of goods exported from Baltimore for the three fiscal years ended June 30, 1894, show that out of \$98,796,856 exported for the year ending June 30, 1892, only 1.53 per cent. was carried in American vessels, while 1893 and 1894 were 1.47 and 1.76 per cent., respectively. This presentation argues the necessity for a change in the present navigation laws.

The Iron Age

New York, Thursday, August 2, 1894.

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RICHARD R. WILLIAMS, - HARDWARE EDITOR.
JOHN S. KING, - - BUSINESS MANAGER.

Pig Iron Statistics.

The statistics of pig iron production in the first six months of 1894, which have just been published by the American Iron and Steel Association, show but slight recovery from the depression ruling during the last half of 1893. There is some consolation, however, in the fact that there was a recovery even if it was but slight. The figures show a total production for the country of 2,717,983 gross tons of all kinds of pig iron in the six months just ended, as compared with 2,561,584 tons in the last half of 1893. The increased output was only 156,399 tons, or 6 per cent. As compared with the first half of 1893, the falling off was enormous. The country then made 4,562,918 tons. The decline on this showing was no less than 1,844,935 tons, or over 40 per cent. Taking the first half of 1894 and the last half of 1893, the product for these 12 months was 5,279,567 tons. In order to show how the output of these 12 months compares with that of previous years the subjoined table is given, showing the annual production of the country from 1886, in which year our output first exceeded the 5,000,000 ton mark:

Years.	Gross tons.	Years.	Gross tons.
1886.....	5,688,329	1890.....	5,202,703
1887.....	6,417,148	1891.....	8,279,870
1888.....	6,496,738	1892.....	9,157,000
1889.....	7,603,642	1893.....	7,124,502

The production for the 12 months ending June 30, 1894, was therefore the smallest for any similar period in more than eight years. Such a decline would have seemed incredible if it had been predicted in the beginning of 1893. Dark as the prospect then was, and apprehensive as everybody felt that the iron trade was about to pass through a period of acute distress, no one dreamed that pig iron production could possibly fall to so low a point. Since 1885 the annual consumption of pig iron has ranged from 6,000,000 to over 9,000,000 tons, and it was confidently believed that under the most serious pressure of enforced economy the country would need at least 7,000,000 tons annually. Yet in these 12 months the consumption has been so far below its natural level that the new product was but 5,279,567 tons. The consumption was not much more than the output, as stocks of iron in makers' hands were reduced but slightly during this period.

Analyzing the tables, some interesting results are obtained. All sections of the country shared in the depression, but not equally. The Northeastern States, including Maryland, show a

decline in the first half of 1894, as compared with the first half of 1893, of over 40 per cent.; the Southern States, excluding Missouri, of 38 per cent.; the Central Western States, of 44 per cent.; the trans-Mississippi States, of 56 per cent. The reaction from the extreme depression of the last half of 1893 was greatest in the West. Comparing the output of the first six months of 1894 with that of the preceding six months, the Northeastern States show a falling off of 6 per cent., but the Southern States gained 2 per cent., the Western States 54 per cent. and the trans-Mississippi States 35 per cent. The most conspicuous gain was made in Illinois, in which State every furnace had been out of blast during the closing months of 1893.

The production of charcoal pig iron has been heavily restricted. In the first six months of this year all the charcoal furnaces of the country only turned out 102,697 gross tons, against 149,549 tons in the preceding six months and 237,240 tons in the first half of 1893. The total output of charcoal iron in the 12 months ended June 30 last was 252,246 tons, against 386,789 tons for the year 1893; 537,621 tons for 1892; 576,964 tons for 1891, and 628,144 tons for 1890. The year 1890 was the maximum year of charcoal iron production. The decline since then has been most remarkable. It is further discouraging to the charcoal iron trade to note the fact that stocks of unsold iron are increasing. On June 30 there were 229,705 gross tons in furnacemen's yards, or more than double the output for the six months then ended. At the beginning of the year the stocks aggregated 207,181 tons, and on June 30, 1893, they had been down to 184,536 tons.

On June 30 last only 108 stacks, including all kinds of fuel, were blowing in the United States. No fewer than 408 stacks were idle. The number of active stacks was 29 less than on December 31 previous. This would seem to indicate a reduced output for the six months upon which we are now entering, but it must be borne in mind that the coke strike, rather than the depression in the iron trade, is now responsible for the idleness of a considerable number of furnaces, which will be blown in as soon as fuel can be regularly obtained. The production of the current six months will undoubtedly show a gain on that of the first half of the year, and perhaps a marked recovery from the depression of the past 12 months.

Numerous instances are coming to light of the expedients to which Western business men were obliged to resort while the Debs embargo on railroad transportation was in full force and effect. Wherever considerable loss would have been sustained by a failure to deliver goods within a reasonable time, recourse was had to the rivers or to the few canals still to be found in some sections, or to the primitive method of teaming. A great deal of

agricultural machinery was hauled long distances by wagon, because the strike occurred just when harvesting had begun, and there are always plenty of farmers who will not purchase machinery until they see that it is absolutely needed. Those who paid the freight on these team delivered goods are in a position to draw comparisons which are strongly in favor of railroad transportation. Rivers and canals also proved poor substitutes for the steel roadway.

Exhausting Smoke from Forges.

Improvement in the method of removing the smoke from the numerous forge fires in large smith shops has kept pace with other innovations, so that to-day we may note in many establishments the old time chimney connection from each forge completely removed and in its place a carefully planned system of exhausting the smoke by mechanical means. Advancement in this line has been rapid in the past few years until such arrangement now forms almost an inherent part of any complete equipment.

The inconvenience of the damp chimney flue that would not draw and the common difficulty of getting the smoke to move in the proper direction—*i. e.*, up the pipe—while a fire was being started have, of course, been most important factors in bringing about the change. In the most recent arrangements as introduced in large railroad smith shops a single or double exhausting fan has been placed overhead on the roof trusses near the center of the building. From the inlet of each fan pipes are extended horizontally until they connect to the upright pipes from the forge hoods. These hoods, in some of the latest equipments, have been made double—a cone within a cone—separated some 1 or 2 inches and so arranged—with only a small hole at the apex of the inner cone—that considerable suction is created around the annular ring at the bases of the cones. The smoke, particularly at the time of starting up, is thereby prevented from curling down around the lower edge of the hood and thence escaping to the room with objectionable results. Obviously the hoods may be pyramidal as well as conical.

Such hoods can be readily counterbalanced and the pipe above arranged to telescope so that they may slide upward. Each pipe should be provided with a blast gate or damper that may be closed when the forge is not in use, and waste of power thereby avoided.

The ordinary cased fan of the paddle type, as commonly employed for this work, is generally arranged to discharge directly upward through the roof, and is driven at such speed as to deliver smoke and air through the outlet pipe at a velocity of about 4000 feet per minute.

Of course the same or a similar arrangement is applicable to all classes of open fires, in fact to all producers of smoke or objectionable gaseous

fumes, and the product may be discharged at a distant point where its presence will not be disturbing.

Cheap Fire-Box Steel.

The assertion is made by those who should know all the facts that a tendency has lately developed among engineers to draw up specifications for boiler plate which are decidedly favorable to basic steel. The peculiarity of such specifications lies in the ease with which a comparatively cheap grade of basic steel can be made to conform to the apparently rigid requirements. This is the explanation given for the very low price at which some boiler contracts have recently been taken, although the purchasers of the boilers were under the impression that they were securing the best fire box steel. The engineers who prepare such specifications know what they are doing and are evidently not averse to assuming the responsibility for the performance of the steel in the boilers. It is, however, a severe blow to the makers of high grade boiler plate who have for years kept up the quality of their product in spite of the cheapening influences surrounding them, and have until recently believed that they were sustained not only by discriminating consumers, but by the engineering fraternity, who are presumed to look after the best interests of the public. A prominent member of the plate trade characterizes this bias in favor of basic steel as "the degradation of high grade steel." There will certainly be no room left for it in the boiler plate trade if a product that can be made so much more cheaply will really fill its place satisfactorily.

The absorption by the United States Cordage Company of the big plant of the Pearson Cordage Company has been successfully accomplished. The latter has hitherto been the chief competitor of the Cordage Trust, and its acquisition is regarded as a triumph to the latter. The purchase price of the plant is said to be \$1,000,000. The United States Cordage Company—the successors of the National Cordage Company, who went into liquidation a year ago—completed the adjustment of their affairs last week. Frank K. Sturgis was elected president of the corporation; and the following Executive Committee was chosen: F. K. Sturgis, W. W. Sherman, Francis Smith, E. F. C. Young, Rudolph Keppler and John I. Waterbury. The other officers of the company are: Vice-president, W. H. Corbin; secretary and treasurer, W. C. Lane; Finance Committee, G. G. Williams, F. K. Sturgis and G. H. Gossler.

Three thousand pounds of a German smokeless powder has been received at the Frankford Arsenal and will be tested in the big guns at Sandy Hook.

The United States Consul-General at Panama reports that the Legislature of that State has enacted a law imposing a 10 per cent. duty on all imports.

The Baldwin Locomotive Works of Philadelphia have just completed their first electrical engine.

Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., July 30, 1894.

The special report to the Secretary of the Treasury by Ira Ayer, special agent Treasury Department, relative to the production of tin and terne plates in the United States during the quarter ended March 31, 1894, with comparative statements of production, has just been received at the Treasury Department and has been placed in the hands of the printer. The report makes an excellent showing of progress notwithstanding the adverse conditions placed in the way by threatened hostile legislation. The following is a very full synopsis of the report, which will speak for itself. Mr. Ayer says:

I have the honor to report that during the quarter ended March 31, 1894, 36 firms manufactured 38,260,411 pounds of tin and terne plates proper, against an output of 27,851,241 pounds by 39 firms during the previous quarter.

Of the output for the quarter 27,765,-

than 63 pounds per 100 square feet was 6,317,217 pounds in excess of that of any previous quarter since the law became operative.

Eighteen rolling mills made sworn returns of production, against 17 that made sworn returns for the quarter preceding.

Consumption of American Plates.

Of the 36 firms that made sworn returns of the manufactured commercial tin and terne plates 19 used wholly American plates, with an output of 19,552,682 pounds. Three used wholly foreign plates, with an output of 3,020,992 pounds; 14 used both American and foreign plates, with an aggregate output of 15,686,737 pounds, of which 822,480 pounds were made from American black plates.

Fourteen stamping or other manufacturing companies that use American sheet iron and steel in the manufacture of articles and wares tinned or terne plated submitted sworn statements, as against 16 during the previous quarter.

Then follows a comparative statement of the manufacture of tin and terne plates by quarters, of which the following are the totals for fiscal years:

Period of manufacture.	American black plate, pounds. Total.	Per cent. American Average per quarter.	Foreign black plate, pounds. Total.	Per cent. foreign. Average per quarter.	Total. Pounds.
Four quarters :					
July 1, 1891, to June 30, 1892.	9,296,553	68.12	4,350,166	81.88	13,646,719
July 1, 1892, to June 30, 1893.	43,599,724	43.68	56,219,478	56.32	99,819,202
Three quarters :					
July 1, 1893, to March 31, 1894	52,468,858	56.56	40,290,274	43.44	92,751,132

162 pounds, or more than 72 per cent., were made from sheets rolled in the United States, and of this amount 26,382,273 pounds, or more than 95 per cent., consisted of the class of plates weighing lighter than 63 pounds per 100 square feet.

Of the commercial plates manufactured during the quarter 26,313,561 pounds were coated with tin, and 11,946,850 pounds were terne coated.

The quantity of American sheet iron and steel made into articles and wares, tinned or terne plated, was 2,162,889 pounds. This makes the aggregate output of tin and terne plate for the quarter from all sources 40,423,300 pounds; that of the previous quarter was 28,595,948 pounds.

The production for the quarter, subject to comparison with net reports under the Department's ruling, inclusive of products from American sheet iron and steel, tinned or terne plated, was 28,545,162 pounds, as compared with 16,553,716 pounds during the previous quarter.

The production for the three quarters of the fiscal year respectively, subject to such comparison, was as follows:

Quarter ended.	Pounds.
September 30, 1893.....	9,257,610
December 31, 1893.....	16,553,716
March 31, 1894	28,545,162

Total nine months ended March, 1894

54,356,488

Black Plate Product.

The production of black plates in the United States during the quarter was 30,070,701 pounds, and of this amount 23,514,881 pounds, or more than 78 per cent., belonged to the class weighing lighter than 63 pounds per 100 square feet.

The production of the previous quarter was 19,679,910, of which 17,197,664 pounds, or nearly 90 per cent., were of the lighter class.

The production of American black plates of the class weighing lighter

The amount of American sheet iron and steel made into articles and wares, tinned or terne plated, during the same period was:

Totals.	
Four quarters, July 1, 1891, to June 30, 1892.....	5,620,867
Four quarters, July 1, 1892, to June 30, 1893.....	8,802,681
Three quarters, July 1, 1893, to March 31, 1894.....	4,460,409

The production of fine sheet steel and black plates in the United States July 1, 1891, to March 31, 1894, was:

	Lighter than 63 pounds	63 pounds and heavier.	Total.
	Pounds.	Pounds.	Pounds.
Four quarters, July 1, 1891, to June 30, 1892.....	7,826,927	18,586,329	26,213,256
Four quarters, July 1, 1892, to June 30, 1893.....	40,892,420	22,789,121	63,681,541
Three quarters, July 1, 1893, to March 31, 1894.....	48,859,637	12,246,342	61,105,979

Imports and Exports.

The quantity of tin and terne plates imported and entered for immediate consumption, and of such as were imported on and after July 1, 1891, and were withdrawn from warehouse for consumption during the quarter ended March 31, 1894:

Imports.

	Lighter than 63 pounds	63 pounds and heavier.	Total.
	Pounds.	Pounds.	Pounds.
Tin plates...	98,838,930	2,829,821	101,168,751
Terne plates...	6,307,182	46,857	6,354,039

Totals.... 105,146,112 2,876,678 107,522,780

The quantity of tin and terne plates on which duties had been paid, and which were used in the manufacture of articles exported, with benefit of drawback, during the quarter:

Exports.

	Lighter than 63 pounds	63 pounds and heavier.	Total.
Tin plates...	Pounds. 34,787,747	Pounds. 69,386	Pounds. 34,857,183
Terne plates...	18,298	112	18,410
Totals....	34,806,045	69,498	34,875,543

Then follow six exhibits going into details bearing upon the summaries contained in the report.

The Bethlehem Plate.

The detailed report of the secondary ballistic test of the 18-inch Harveyized nickel steel armor plate, representing Group 14, Bethlehem Iron Company, made July 20, 1894, at Indian Head, has been received. The technical results of this test have been given in *The Iron Age*, but the report in full, which is signed by Lieut.-Commander A. R. Couden, Lieut. W. E. Mason and Prof. P. R. Alger, gives the following interesting particulars upon the effect of the projectile:

Round 1.— . . . “The projectile broke up, point and ogival welding into impact and other pieces flying to considerable distances, one piece of body, weighing 27 pounds, going to the rear 400 feet and falling on platform alongside of gun, striking the saddle strap of 10 inch gun. A bulge 34 inches diameter and from $\frac{1}{8}$ to $\frac{1}{4}$ inch high was raised about impact. The broken pieces of shell metal were very warm. The portions of shell welded into impact were cracked and set up considerably. Estimated penetration, 11 inches. A number of radial cracks, from 4 to 6 inches long and 2 to 3 inches apart, were opened in the bulge.” . . .

Round 2.— . . . “The effect of the shot.—The forward part of the shell, as far as bourrelet, remained in impact, lower part of body and base swelled to diameter about 17 inches, rebounding about 5 feet to front, other pieces scattered. The splash of impact was 26 inches horizontally and 22 inches vertically. The plate was divided into two pieces by an irregular crack from top to bottom, through impact, the two pieces being wedged apart by the force of the blow, the surface of the interior of hole welding into the surface of shell and shrinking away from the rest of the plate. Part of the surface of interior, near mouth, showed signs of fused metal. Bulge not so pronounced. The plate was hot to the hand, to diameter of 30 inches to 32 inches. Hole in face of plate 17 inches diameter. The crack opened out in plate was $\frac{1}{8}$ inch wide at bottom and $\frac{1}{4}$ inch at top. Lower edge of plate sprung out from backing $\frac{1}{4}$ inch. Plate dished slightly about impact. Penetration, 17 inches. Back bulge probably broken. Shell turned a little to the right in penetrating.”

The test of this plate appears to be a subject of more discussion than any other on account of its maximum and diminishing thickness and great size. These particulars were given in *The Iron Age* of last week.

The President has signed a bill authorizing the construction of a bridge across the Missouri River, at Lexington, Mo.

CORRESPONDENCE.**Freight Discriminations.**

To the Editor: In your issue of 19th “Shipper” criticises an earlier contribution. His article is valuable in calling public attention to the manner in which the interests of localities are trifled with under the present arbitrary systems of rate making by the railroads.

The discrimination is evidently sometimes against Pittsburgh, as in the case of Southern points; and sometimes in favor of it, as in the case of Eastern points; but, in all cases, it is purely arbitrary, and the prosperity of whole sections of country is shown to be at the mercy of the railroads. They can make or unmake, and their action depends simply upon the amount of influence brought to bear upon them, and upon the details of their dealings with other roads. The freight rates of an Eastern railroad are often determined by a quarrel between railroads located upon the Pacific Coast. This tremendous and injurious power should be taken from the

The Cost of Making Steel Billets and Slabs.

To the Editor: In view of the approaching return of activity the future price of steel billets and slabs is an interesting problem. The first step toward its solution is the establishment of the ratio which the cost per ton of these articles bears to the cost per ton of Bessemer pig iron. There seems to be cause for doubting whether the ratio indicated by the present and late markets, is the true one. In fact, a careful consideration of the valuable tables of Hon. Carroll D. Wright and of certain well-known facts compels the belief that the loss arising from the sale of Bessemer billets and slabs at an advance of \$4 50 per ton above the price per ton of Bessemer pig iron is startlingly large.

Upon page 156 of his elaborate report (Sixth Annual Report of the Commissioner of Labor, 1890), Commissioner Wright gives tables showing the cost of making steel ingots, as compiled for him from the records of work and cost of seven American Bessemer steel works. The table, exclusive of the cost and quantity of iron, is as follows :

Exhibit No. 1.

Establish- ment.	Manga- nese.	Labor.	Officials and clerks.	Fuel.	Supplies and repairs.	Taxes.	Total.
No. 1.....	\$1.025	\$1.833	\$0.275	\$0.794	\$0.831	\$0.092	\$4.850
No. 2.....	.469	1.923	.116	.383	1.050	.012	3.953
No. 3.....	1.278	1.522	.108	.919	4.43	.010	4.290
No. 4.....	.615	1.692	.116	.460	1.505	.015	4.403
No. 6.....	.513	1.800	.080	.609	.672	.004	3.678
No. 7.....	.627	1.716	.051	.535	.616	.006	3.551
No. 8.....	.496	1.533	.075	.474	.524	.003	3.105
Average.	\$0.717	\$1.717	\$0.117	\$0.566	\$0.807	\$0.022	\$3.976

railroads. The interests of sections should not depend upon the caprices and internal quarrels of railroads, nor be sold out at the instance of some other and more powerful section. The introduction of a mileage system, commended by “Shipper,” is the only avenue of escape from the monstrous tyranny of the railroads, and a concentration of public opinion in a demand therefor is much to be desired.

As regards the matter originally under discussion, attention is called to the fact that, under existing conditions, the discrimination in favor of Pittsburgh concerning shipments to Eastern points applies to the only goods and to the only sections in which Philadelphia has a competitive chance. There is nothing made of iron or steel so cheaply produced in New York or Philadelphia as in Pittsburgh; and when railroad tariffs enable Pittsburgh to reach the markets east of New York at substantially the same rates (only 4 cents per 100 pounds difference) that New York and Philadelphia can, they strike a deadly blow at the iron manufacturing interests of the section in which those cities are located.

I do not deny the injustice of a discrimination against Pittsburgh in the matter of Southern freights; on the contrary, it is well to give prominence to such enormities. But what I do say is that there is a still greater injustice in depriving New York and Philadelphia of the only markets in which they have a competitive chance; and that the temporary opening of a Southern market in which they have no chance for permanent occupancy is not an offset for this injustice.

PRODUCER.

The details concerning establishment No. 5, given by Commissioner Wright, are omitted from this table, because No. 5 is an open hearth plant. If we assume a waste of 12 per cent. upon the pig iron charged, the waste, when pig is valued at \$11 per ton, is \$1.32 per ton of steel. Adding this to costs already shown, we have the following total expense of making steel ingots.

Exhibit No. 2.

Establishment.	Costs.	Waste.	Total expense.
No. 1.....	\$1.85	\$1.32	\$6.17
No. 2.....	3.95	1.32	5.27
No. 3.....	4.29	1.32	5.61
No. 4.....	4.40	1.32	5.72
No. 6.....	3.63	1.32	5.00
No. 7.....	3.55	1.32	4.87
No. 8.....	3.10	1.32	4.42
Average cost of making ingot steel in the seven establishments, \$5.29.			

The low costs shown in Exhibits Nos. 1 and 2 for establishments Nos. 6, 7 and 8 invite attention to the fact that, as shown by the figures of Commissioner Wright, on page 154, they claim to make a ton of ingot steel from the following quantities of Bessemer iron, respectively: No. 6, 2267 pounds; No. 7, 2393 pounds; No. 8, 2285 pounds. Since it is physically impossible to make a gross ton of Bessemer steel from those quantities of ordinary Bessemer iron, it appears possible that the returns for costs of labor, &c., made by those establishments apply to a net ton (2000 pounds) of steel ingots, and should be increased by 12 per cent. No correction for this error is made in the

computations in this article excepting that the waste is assumed as being 12 per cent. in estimating cost of waste; for experience has shown 12 per cent. to be a fair average waste in the Bessemer converter.

In another series of tables (pages 183-190) Commissioner Wright shows, among other matters, the cost of reducing ingots to blooms, slabs and large billets in seven establishments in the United States. From these tables Exhibit No. 3, below, has been collated. Columns 3 and 4 show the quantities of ingots charged and slabs produced as given by Commissioner Wright. Columns 5, 6 and 7 are computations from columns 3 and 4, in which it is assumed that the average furnace waste in heating an ingot is 2 per cent., and that the remainder of the shrinkage is represented by the crop end, valuable as scrap.

tain as the cost, including waste, of reducing ingots into 1 ton of slabs, blooms or large billets..... \$3.07 As has been shown, under Exhibit No. 2, the cost, including waste, of converting 1 ton of ingots from pig iron, valued at \$11 per ton, is..... 5.29 Therefore, the cost per ton of 1 ton of slabs, blooms or large billets, under the conditions of 1859, above the cost of 1 ton of Bessemer pig iron valued at \$11, is..... 8.36 And 1 ton of Bessemer slabs, blooms or large billets, made from pig iron valued at \$11 per ton, costs..... 19.36 It is from iron costing about \$11 per ton that have been chiefly made the Bessemer blooming mill products which were recently selling at \$15.50 per ton; and if the costs of manufacture are to-day the same with those collected by Commissioner Wright in 1890, the average loss on the sales has been nearly \$4 per ton.

Two questions now suggest themselves, to wit:

Exhibit No. 3.

Steel works.	Ingots charged.	Blooms, billets and slabs produced.	Shrinkage.		Scrap. Per cent. of charge.	Product.
			Tons.	Tons.		
No. 17....	28,343	25,262	3,081	11.00	2	Billets and nail slabs.
No. 25....	10,631	9,669	0,962	9.06	2	Blooms.
No. 16....	24,617	21,916	2,701	11.00	2	Billets and nail slabs.
No. 27....	61,895	52,982	8,993	14.40	2	Blooms and billets.
No. 28....	68,790	61,240	7,550	10.97	2	Blooms and nail slabs.
No. 26....	74,130	64,684	9,446	12.74	2	Blooms and billets.
No. 29....	61,200	55,096	6,164	10.00	2	Blooms and billets.
Average.....					9.31	

The high percentage of scrap waste in the output of No. 27 suggests that some of the billets produced may have been small ones, produced by a second rolling; but as the costs of labor, shown in table given below (Exhibit No. 4), do not fully justify this theory, the figures are included in the computation of the general average. This computation shows an average total waste of 2 per cent. and scrap waste of 9.31 per cent. of the ingot charged.

Assuming the scrap to be of the same value as pig iron, and that the loss upon it is that of converting it into ingot steel (\$5.29 per ton), the waste in converting ingots made from \$11 Bessemer pig iron into slabs, blooms or large billets is as follows:

Waste in furnace (2 per cent. of 2240 pounds), 44.8 pounds, at \$16.29 per ton.....	\$0.325
Waste in scrap (9.31 per cent. of 2240 pounds), 208.5 pounds, at \$5.29 per ton.....	.492

Total waste per ton of slabs..... \$0.82

Exhibit No. 4, arranged from the tables of Commissioner Wright, shows the costs per ton, other than waste, of reducing ingots to slabs in the seven establishments (blooming mills) named, the daily production of slabs being given in the second column.

Exhibit No. 4.

Blooming mill.	Tons slabs daily.	Labor.	Officers and clerks.	Fuel.	Supplies and repairs.	Taxes.	Total.
No. 17....	216	\$1.182	\$0.130	\$0.311	\$0.991	\$0.026	\$2.640
No. 25....	604	1.434	.362	.309	.368	.009	2.482
No. 16....	131	1.278	.130	.238	.416	.028	2.078
No. 27....	201	1.108	.094	.269	.366	.010	1.847
No. 28....	308	1.308	.057	.311	.343	.104	2.121
No. 26....	240	1.252	.086	.272	.276	.008	1.894
No. 29....	198	1.089	.218	.650	.704	.027	2.688
Average.....		\$1.235	\$0.154	\$0.336	\$0.495	\$0.030	\$2.25

By adding to the costs (\$2.25) thus specified the costs of waste as shown under Exhibit No. 3 (\$0.82), we ob-

allowance for, even when these items make no important figure in the transactions of a single designated year. The

importance of these omitted items will become evident upon comparing the estimates of costs rendered by certain establishments in Great Britain with the market prices of steel in that country of small margins.

The items were the same with those included by Commissioner Wright in his tables showing the costs of steel making in the United States; and they represent the actual work of three representative establishments in Great Britain. The tables are as below (exhibits Nos. 5 and 6, columns 1, 2, 3, 4, 5 and 6, and, in each table, column 7 is added, showing the cost of waste, as assumed in the case of the plants in the United States, to wit, in ingot making, 12 per cent. on pig iron, at \$11 per ton; and in bloom, billet and slab making, 2 per cent. furnace waste, with 9.31 per cent. waste returned as scrap).

Exhibit No. 5.—Cost of Making Bessemer Ingots in Great Britain, 1889.

Labor.....	\$0.63
Officials and clerks.....	.07
Fuel.....	.52
Repairs and supplies.....	.68
Taxes.....	.01
Manganese.....	.40
Waste.....	1.32
Total.....	\$3.63

Exhibit No. 6.—Cost of Making Bessemer Blooms, Slabs and Billets in Great Britain in 1889.

Labor.....	\$0.69
Officials and clerks.....	.02
Fuel.....	.36
Repairs and supplies.....	.50
Taxes.....	.02
Waste.....	.63
Total.....	\$2.22

Hence we have:

Cost in Great Britain of making 1 ton ingots from Bessemer iron valued at \$11 per ton.....	\$3.63
Cost in Great Britain of making 1 ton slabs, blooms and billets from ingots valued at \$14.63.....	2.22

Cost in Great Britain of 1 ton slabs, blooms or billets above cost of 1 ton of Bessemer pig iron.....	\$5.85
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The selling prices of pig iron and steel in the close markets of Great Britain are, as shown in recent quotations, as follows:

Bessemer pig iron, 45 shillings 3 pence, or \$11.

Steel blooms, £3. 15/, to £4, or \$18.22 to \$19.43.

Steel billets and slabs, £4 to £4.5/, \$19.44 to \$20.65.

That is to say, the British manufacturer is in 1894 demanding and receiving from \$1.37 to \$3.80 per ton more for the manufacturing costs of the products of his converter and blooming mill than were the costs of 1890, as shown by such items as were included in the tables of Commissioner Wright. There is no unusual activity in the British market; and it may be fairly assumed that the margin above cost in the selling price is a small one, as is usual in that market.

Since the items given by Commissioner Wright in computing the cost of British steel making thus fail to embody all the costs, it follows that the same items fail also to embody all the costs of American steel making, and there is not satisfactory reason for believing that the total cost in the United States of converting and reducing in 1894 is any less than the sum of these items which were given by Commissioner Wright as representing the cost in 1889.

In the comparative table below, Exhibit No. 7, the value of pig iron is in all cases assumed at \$11 per ton, that

being the present market value in Great Britain, and having been also for the most part the value in the United States at the time when billets were selling at \$15.50 per ton, and the same value for iron is assumed in computing costs as fixed by the tables of Commissioner Wright:

Exhibit No. 7.

Commissioner Wright's cost of British blooms, billets and slabs.....	\$16.85
Commissioner Wright's cost of American blooms, billets and slabs	19.36
Selling price, in Great Britain, of British blooms.....	\$18.22 to 19.43
Selling price, in Great Britain, of British billets and slabs.....	\$19.43 to 20.65
Selling price of American blooms, slabs and large billets.....	15.50
Apparent loss on sales of American blooms, slabs and large billets....	3.86

These results are subject to such correction as arises from the fact that during a short period the price of American pig fell to \$10.25 per ton, while an assumed value of \$11 is used in all the above computations.

But this does not affect the accuracy of the inference that billets and slabs are sold at a loss to the maker when sold at less than \$8 per ton above the price of the Bessemer pig iron of which they are made.

INVESTIGATOR.

OBITUARY.

JOSEPH A. KING.

Joseph A. King of the Hardware firm of King & Dexter, Portland, Maine, died suddenly a few days since at his home in that city. Mr. King was born in Paris, Maine, September 14, 1840. He was educated in the common schools of his native town, and when very young went to Providence, where he entered one of the largest Hardware houses in that city to learn the business. In 1865 Mr. King removed to Portland, and in company with Capt. J. D. Dexter of Providence bought out the old stand of Chase, Littlefield & Co., and organized the firm of King & Dexter, who have occupied the same premises for nearly 30 years, with the exception of a few months, when the store was burned out in the large fire of 1866. Captain Dexter withdrew from the firm about 14 years ago, and removed to San Diego, Cal., where he now resides.

PERSONAL.

N. Rattigan for the past ten years superintendent of the converting department of the Homestead Steel Works and Ed. Donahue, assistant superintendent of the labor department of the Edgar Thomson Steel Works and blast furnaces have resigned.

O. M. Hartzell, the well-known iron broker of Pittsburgh and secretary of the Wire Nail Association, sails for Germany on Saturday, August 4, on a short business trip, and expects to return to this country about September 1.

The Pencoyd Iron Works have dismantled the iron frame work at Front and Arch streets, Philadelphia, which the Northeastern Railway Company began to erect in March, 1893, and with it Philadelphia's dream of an elevated road and rapid transit has vanished. A half million dollars had been sunk in the project when operations were stopped, in May last, by an adverse opinion by the Supreme Court.

MANUFACTURING.

Iron and Steel.

Rosena Furnace, at New Castle, Pa., after being cold for 15 weeks has again resumed operations, and will furnish Bessemer iron to the plant of the Shenango Valley Steel Company at that place. The furnace was in excellent condition, considering the length of time it was banked.

As yet the Brown, Bonnell Iron Company, Youngstown, Ohio, have not come to a definite decision regarding the erection of a new blast furnace, which has been under contemplation for some time. Plans and specifications for the new stack have been examined by the firm, but, as stated above, the question of erecting it has not been decided. Phoenix Furnace of this firm has been recently repaired, and will be put in blast as soon as a steady supply of coke is assured.

The Ohio Falls Iron Works, New Albany, Ind., signed the Amalgamated Association scale last week and have resumed operations.

A slight explosion occurred last week at Furnace I of the Edgar Thomson Steel Works, Bessemer, Pa., and two or three men were seriously burned.

Application for a charter for a corporation to be known as the Brady's Bend Coal & Iron Company, with headquarters at Kittanning, Pa., will be made on August 20. It is the intention of the corporation to mine coal, iron ore, limestone, silica and clay, and drill for oil and gas and to manufacture coke. The applicants are: C. O. Billings of Boston, J. D. Gillette, Amos Tenney, Wayne Griswold, W. D. Judson and Isaac Freese of New York; W. E. Tuskin, W. J. Hammond and W. J. Hammond, Jr., of Pittsburgh.

At Pittsburgh last week an execution for \$5500.26 in favor of E. Z. Wangenheim against the McKinley Tin Plate Company of Wilkinsburg, Pa., was issued.

The Indiana Iron Company, Muncie, Ind., signed the Amalgamated Association scale last week.

Fire destroyed another section of the Eureka Iron Works, at Wyandotte, Mich., on the 21st ult. The portion burned this time was known as the rail mill and had not been in use for many years. Its origin is attributed to an incendiary, as there had been no occasion to use fire in or near the building.

Nearly all departments of the plant of the Carbon Steel Company, at Pittsburgh, manufacturers of open hearth steel, are in operation on double turn.

The Iron Cliffs Company are about to build a blast furnace at Gladstone, Mich. It is seven years since the last furnace was built in that section of the country. It will use charcoal for coal.

Isabella Furnace, owned by the estate of Joseph D. Potts, Wyebrooke, Pa., has blown out, to remain idle, it is said, until October.

Jefferson Furnace, at Steubenville, Ohio, has blown in, after three months' idleness caused by the coal strike.

Orders have been received at Easton to discharge all employees of the Glendon Iron Company, at Glendon, Pa.

The Valley mill of the Glasgow Iron Company, Pottstown, Pa., has resumed operations.

The men employed in the mills of the Potts Bros. Iron Company, Limited, at Pottstown, Pa., have been notified that the plant will resume in all departments this week.

The pump house, boiler house, warehouse and cold nail factory at Belleville, Ill., owned and operated by the Valley Steel Company of St. Louis, Thomas A. Mysenberg, president, have been destroyed by fire. The warehouse contained about 2500 kegs of nails. The total loss of buildings, machinery and stock is estimated at \$30,000, about one-half of which is covered by insurance. The origin of the fire is unknown. The burned buildings were erected in 1883 by the Western Nail Company. The fire will cause a suspension of work at the establishment for some time, although the nail factory and main part of the plant was not injured by the fire. It is understood that the burned buildings will be replaced as soon as the insurance is adjusted.

The Lima Machine Works, Lima, Ohio, have purchased the plant of the Lima Steel

Casting Company, lately destroyed by fire, and will commence at once to rebuild the plant.

A correspondent of the Doylestown (Pa.) Democrat says: "The Durham Iron Works, which have been comparatively idle, with the exception of the mines and molding shop, for over two years, are now passing through a critical ordeal. The proprietors of the furnace have under consideration the advisability of either a complete shut down or a speedy resumption of work."

The plate mill of Wm. McIlvain & Sons, Reading, Pa., has been put in operation.

L. W. Lloyd of Marshall has purchased an interest in the Vulcan Iron Works of Hillsboro, Texas, his idea being, it is stated, to form a stock company to put the plant in shape and operate it at once.

The furnaces of the Londonderry Iron Company, Limited, at Londonderry, N. S., have been blown out in order to make necessary repairs. The furnaces have been in blast for three and one-half years.

The blast furnace of the Bellaire Nail Works, Bellaire, Ohio, is in operation, and as soon as a sufficient supply of Bessemer pig has been accumulated, the Bessemer plant will be put in operation.

The plant of the Pittsburgh Steel Casting Company, Pittsburgh, is in operation to nearly full capacity, and the firm have more orders on hand at this time than during any period of the last 18 months.

Rosena Furnace and Atlantic Furnace, both at New Castle, Pa., have blown in.

One of the Swede furnaces of R. Hecksher & Sons, Swedeland, Pa., is being repaired and will be ready to go into blast in about a month.

Mills Nos. 6 and 7 of the Whitaker Iron Company, Wheeling, W. Va., manufacturers of black and galvanized sheet iron, resumed operations last week, and will continue in operation as long as sufficient orders are received to keep them employed. The new mills now under erection by this firm are expected to be in readiness for operations sometime during the latter part of August.

Machinery.

Rhode Island Tool Company, Providence, R. I., are running full time on their regular product—bolts, nuts and drop forgings. The plant of this concern has been undergoing a general overhauling and is now in first-class shape for handling a larger business than ever before.

Belknap Motor Company, Portland, Maine, manufacturers of the Belknap B. C. Standard dynamos and motors, have recently completed additions to their factory which afford an increase of 7000 feet of floor space and provide a convenient tool room and pattern shop. This concern are making a specialty of dynamos for running elevators and detached machines.

It is reported that the orders of the Westinghouse Electric & Mfg. Company of Pittsburgh for the present month will probably exceed the orders for any one month in the history of the concern. June shipments exceeded \$560,000, and July orders thus far are in excess of that sum.

The Girard Stove & Foundry Company, Girard, Ohio, have decided to buy the plant of the Youngstown Foundry Company, Youngstown, Ohio, and will remove their plant to that place and considerably enlarge their business. The capital stock of the concern has been increased to \$40,000.

The plant of the McConway Torley Company, at Pittsburgh, manufacturers of malleable iron castings and sole manufacturers of the Janney coupler, has been closed since July 1 for the usual stock taking and repairs, but operations will be resumed during the present week. The plant will not run to full capacity, but will employ about one-third of the usual force, and run about half time. The manufactures of this concern are used almost exclusively by railroads, and, as every one knows, the demand for railway material has been extremely light for more than a year.

The A. M. Holter Company of Helena, Mont., report the demand for mining machinery to be on the increase. This demand, Manager Patenaude says, is for the better class of machinery. During the past six months the sales have been largely in the line of boilers and steam engines; some few horse whims have been sold, but the aggregate in that regard does not compare with that for the more substantial machinery.

The Capital Iron Works Company of Topeka, Kan., have just finished for the

Baird Portable Machine Company of Topeka four pieces of machinery purchased by the Baldwin Locomotive Works, at Philadelphia. All of these machines are the invention of Archibald M. Baird of the Santa Fé shops. The superintendent of the Baldwin Locomotive Works recently visited Topeka to inspect these machines, and on his return home they were ordered by the company. The Capital Iron Works manufacture all the patents of the Baird Company, as follows: Tank riveters, mud ring riveters, stay bolt cutter, truck riveter, stay bolt breaker single, stay bolt breaker double, and pneumatic drilling and tapping machines. In the past six months the works have turned out 40 of these machines, and the manager, Thomas Parkinson, has many orders for future work now on his books.

For several weeks it has been rumored that the Waterman Machine Tool Company, George V. Rogers, president and treasurer, one of the oldest and best known manufacturers of high grade machine tools in the country, had purchased the shops and business in Oakland, Maine, now known as the Oakland Machine Company. It is understood that this is a modern plant throughout and was built by Dustin & Hubbard about six or seven years ago. During the past few years the Waterman Machine Tool Company have introduced many new tools, particularly in the line of boring and drilling machines. The last year, which has been an unusually dull one for machine tool builders, has been a busy one for this company, and the business year ending July 12, 1894, it is stated, shows the most profitable results in its history. It is the lack of room with suitable facilities for handling their product that induced them to locate in Maine, where the factory, which is in full running order, was quickly available without seriously holding back their orders. This company, who recently purchased the H. C. Pease iron planer business, formerly of Worcester, Mass., have improved these tools. They will also manufacture the Dexter Machine Company's lathes and drills. A larger part of the machinery has already been forwarded to Oakland, Maine. The new plant will be in full operation by August 1.

The west side shop of the Vulcan Iron Works, Pittston, Pa., has restored 5 per cent. of a 10 per cent. reduction made early in the spring, and resumed on ten hour shift in all departments.

The new works of the Johnson Weldless Chain Company, at Braddock, Pa., have been put in operation with a force of 50 men. It is intended to enlarge the works at an early date.

The Union Iron Works, at Erie, Pa., have started up on full time and with a full force in all departments.

The McMillan Machine Company of Ilion, N. Y., have filed a certificate of incorporation with the Secretary of State. Their objects are to manufacture, lease and sell typesetting machinery and all kinds of mechanical tools, implements, machines and appliances.

The G. A. Gray Company, with works at Cincinnati, Ohio, announce that in order to deal directly with their Eastern customers, and thus facilitate trade, they have withdrawn from all local selling agents, and have established their own store at 121 Liberty street, New York. They will carry in stock there a limited number of machines representative of the various types of planers built by them, and of which they make an exclusive specialty. The new store is under the management of Henry Marx.

The works of the Toledo Tool & Machine Company, at Toledo, Ohio, recently had a narrow escape from total destruction by fire. The first started on the third floor and was caused, it is supposed, by spontaneous combustion, since the floor was unoccupied at the time. The prompt work of the firemen kept the flames from spreading, though the machinery on the lower floors was damaged somewhat by water. The loss is placed at \$900,000 insured, but valuable patterns, of which there are no duplicates, were destroyed.

The works of the E. W. Bliss, Company, Brooklyn, N. Y., are running full time, with 460 men, and turning out a number of large orders for early shipment. They have shipped within the last two weeks the following of their new improved trimming presses for trimming drop forgings and heavy hardware: One 73 $\frac{1}{2}$ press with cut off attachment; two 74 $\frac{1}{2}$ and one 75 presses, all for a large agricultural implement man-

urer; a 600-pound drop hammer and a 1500-pound drop hammer, taken by two large heavy hardware manufacturers, and a 400-pound drop hammer and a 3 $\frac{1}{2}$ toggled drawing press with a complete set of dies, both of which went to a lamp manufacturing concern in the East.

Business at the Baldwin Locomotive Works, Philadelphia, is very dull. The amount of the output at the present time is only about 20 per cent. of the amount for the corresponding period of last year. With the exception of some general foundry work there is practically no domestic trade, the locomotives in course of construction being for foreign shipment. Six locomotives were recently completed and shipped to Brazil.

The National Wheel Company, Jackson, Mich., state that they are in the market for a Corliss pattern stationary engine, 18 x 36 inches cylinder, or with condenser, 16 x 36 inches.

Included in orders for tin plate machinery recently received by the Leechburg Foundry & Machine Company of Pittsburgh, are three Mesta patent pickling machines. One of these is for shipment to Wallace, Banfield & Co., Limited, at Irondale, Ohio, which concern are making some improvements and additions to their plant with a view of considerably increasing their capacity. Another is for shipment to the Morton Tin Plate Company, Cambridge, Ohio, which concern are erecting a tin plate plant, while the third one is for the Pittsburgh Tin Plate Works, Incorporated, New Kensington, Pa., this concern having now under erection three mills for rolling black sheets for tinning purposes.

Hardware.

Brittan, Graham & Mathes, Pittsburgh, Pa., have just received a contract for the locks, knobs and hinges for the new Golden Eagle Hotel at Sacramento, Cal.

The Young Reversible Lock Nut Company have been incorporated to manufacture bolts, lock nuts and railway supplies at Hempstead, N. Y. The directors of the company are L. H. Young, P. L. Ronalds, Jr., F. J. Lancaster, F. M. Larchar and C. D. Pearce.

The machinery of the old Florence, Mass., tack shop has been sold to the Grand Crossing Tack Company of Chicago, and will be shipped to that city at once and put in operation.

It is reported that C. H. Amidon of Buffalo, N. Y., manufacturer of bit braces, is contemplating the removal of his plant to North Tonawanda.

Sparks from a smokestack ignited the shingle roof of the wood working department of the agricultural implement manufacturing plant of D. Frank Hull & Son, Hagerstown, Md., on the afternoon of the 18th ult. The entire roof was ablaze when discovered, but the flames were quickly extinguished on the arrival of the firemen. The roof was burned off, and the building, a frame one, two stories high, was flooded with water. The machinery and belting were badly damaged, but the loss is reported to be fully covered by insurance.

The Smith & Wesson factory, at Springfield, Mass., which closed down in July, will not, it is thought, resume operations until early in September. The improvements which are making will not be completed much before the first of that month. About 250 men will be taken on at that time, and more will follow as soon as expedient.

The wire nail department of the American Wire Nail Company, Anderson, Ind., has resumed operations with the old force of 400 hands. The rod department of the mill has also resumed, furnishing employment to 300 more hands. The capacity of the plant is 2700 kegs per day.

At the annual meeting of the stockholders of the Gilbert & Bennett Mfg. Company, held at the office of the company in Georgetown, Conn., on the 24th ult., Edwin Gilbert, David H. Miller, Samuel J. Miller, Louis G. Beers and George H. Brown were elected directors for the ensuing year. At the meeting of the directors subsequently held the following officers were elected: Edwin Gilbert, president and treasurer; David H. Miller, vice-president and secretary; Samuel J. Miller general superintendent; Louis G. Beers, general sales agent; Geo. H. Brown, manager of New York store, and Chas. J. Miller, manager of Chicago store. The usual dividend was declared.

The Kearney & Foot Company, Paterson, N. J., and 100 and 102 Reade street, New

York, reopened their works on the 23d ult., after a shut down of nearly a month for their annual inventory and repairs. The company are employing about 400 hands. A pleasant feature of the opening was a surprise to the men in the shape of a notice reading as follows: "As the business conditions of the country will not warrant our running full time, with a view to making the burden as easy as possible to our men we shall restore wages as existing before the 10 per cent. cut was made some months ago, this advance to take place on next pay day." During their 20 years' business experience the company have found it necessary to reduce wages owing to business depression but twice, and in each instance have voluntarily restored the wages without consulting their employees.

The Oliver & Roberts Wire Company of Pittsburgh will shortly make application for a change in the name of the concern to Oliver Wire Company. The change in the style of the firm has been made necessary by the retirement of Henry Roberts, who was connected with it for many years.

The Speeder Cycle Company of New Castle, Ind., have been incorporated, with a capital stock of \$30,000. The object of the company is to manufacture bicycles and the attachment for speeding invented by Dr. Jacob Redding. The directors are Henry J. Adams, Emma Anna Redding, Alma L. Bowman, Jason W. Holloway and Daniel Monroe.

Bommer Bros., 351 and 353 Jay street, Brooklyn, N. Y., report a satisfactory condition of business, and advise us that their plant has been running steadily during the past year, notwithstanding the depression in trade. They have just secured from the World's Columbian Commission the text of the award given them for their spiral spring hinges, in which reference is made to the special features of the goods and the advantages connected with their use.

The Chicago Spring Butt Company, corner Union Park place and Carroll avenue, Chicago, advise us that C. S. Shanklin will sail for Europe per steamer "Campania" of the Cunard Line on August 25, and will make an extended trip through the different European countries in the interest of the goods manufactured by that company. He intends visiting England, Ireland, Scotland, France, Belgium, Holland, Denmark, Norway, Sweden, Germany, Austria and Italy, with the possibility that he may go on to Cape Town in South Africa. The company find that the demand for their goods is constantly increasing in European territory, and think that Mr. Shanklin's trip at this time will tend to add to their already satisfactory European business.

MISCELLANEOUS.

The Sweet & Clark Malleable Iron Company of Marion, Ind., have elected the following officers for the ensuing year: William M. Peckham, president; J. Willard Clark, vice-president and manager; Charles J. Clark, secretary and treasurer; O. G. Clark, J. W. Clark, C. L. Wheeler, Wm. M. Peckham and Charles J. Clark, directors.

John H. Newell, son-in-law of the late Thomas Barnes, for many years head of the firm of the Barnes Safe & Lock Company, at Pittsburgh, last week bought the interest of the Fidelity Title & Trust Company, trustee, in the business. Mr. Newell will hereafter conduct the affairs of the concern on his own account under the firm name of Barnes Safe & Lock Company.

The organization of the Youngstown Steel & Iron Roofing Company, Youngstown, Ohio, was completed last week with the election of the following officers and directors: L. E. Cochran, president; G. M. McKelvey, vice-president; Charles Pew, secretary; Mason Evans, treasurer and John O. Pew, general manager.

Application will shortly be made to the Pennsylvania State authorities for a charter for the Cramp Metal Mfg. Company of Philadelphia. The incorporators are David J. Matlack, Benjamin H. Cramp, Edwin S. Cramp, Courtland D. Cramp and Charles D. Cramp.

R. H. Brown & Co., machinists and manufacturers of specialties, have about completed a large two-story building, which is to be used in manufacturing Empire typesetting machines.

The Western Tube Company of Kewanee, Ill., are constructing a water works system for their own use, in order to escape city water taxes, which they claim are exorbitant.

The Iron and Metal Trades.

In the majority of the great markets and in the trading lines there is a distinct increase in the demand. It is not enough to be particularly jubilant over, nor is it general or uniform. Consumers have been starving themselves so long that they are forced into placing orders for supplies. The railroads are giving out some work for renewals and repairs. They are doing a little in cars and in bridges.

Possibly this may appear more encouraging than it ought to be, because it compares with previous months of complete apathy.

The situation in the Connellsville Coke region has taken an unfavorable turn, so that the starting of a number of furnaces during the past few days may prove to have been premature. The conviction is gaining ground that the long expected decline in Bessemer Pig and Steel Billets in the Central West will not materialize quite so soon. Buyers had been nursing themselves along for a long time, and may come to the conclusion that a waiting game does not pay when it involves buying small quantities at frequent intervals at relatively high prices.

As yet in Pittsburgh, Wheeling, the valleys and Cleveland buyers and sellers are too far apart when it comes to negotiations for large blocks for delivery during the next few months. The former may be forced from their position through the demands for finished product. The Wire trade, the largest consumer of Soft Steel, is beginning to show signs of revival, the inquiries for Rods having become larger and more urgent.

It must not be forgotten that conditions are abnormal both as to supply and as to demand, and that both are pretty evenly balanced. Prices could not help feeling a change in the situation created by even a very modest increase in consumption.

The general business does not seem to encourage hope in that direction, but still it is possible that a settlement of the tariff question may start the ball rolling.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, Chicago, August 1, 1894.

It looked for a part of last week as though another serious misfortune was about to overwhelm Western trade. The drought which had prevailed for several weeks culminated in a very hot wind which seriously injured vegetation and bid fair to almost completely destroy all hopes of a corn crop in some States; great forest fires also broke out in Wisconsin, causing enormous damage in the lumber districts and threatening further destruction. Since then timely rains have fallen and the danger has been averted, the crop scare is probably over, the forest fires have been extinguished and the business world takes renewed hope. The fears of a crop failure affected trade to some extent, but the situation in general seems to have steadily improved and would undoubtedly have shown greater gains if the rain had come sooner.

Pig Iron.—A more cheerful tone is perceptible among the sellers of local Coke Iron. They have enjoyed a much larger trade than for either of two previous weeks and inquiries are coming in quite freely from expectant buyers. Among the orders placed were several for 1000 ton lots and one or two for about 1500 tons. Prices, however, have not advanced with the improved movement, but some modifications have been made in quotations. The Iroquois Furnace blew in to-day. The Bay View Furnace was able to keep in operation during the whole of the railroad blockade. The railroad situation has improved decidedly within the past few days and deliveries are now being made with something like old time promptness. A somewhat better business was transacted in Southern Coke Iron, but only in soft grades, the largest reported sale being one for 300 tons. Lake Superior Charcoal is in slightly better demand, but prices are a little easier. Quotations are given as follows for cash:

Lake Superior Charcoal.....	\$14.25 @ \$15.00
Local Coke Foundry, No. 1.....	10.25 @ 10.50
Local Coke Foundry, No. 2.....	10.00 @ 10.25
Local Coke Foundry, No. 3.....	9.50 @ 10.00
Local Scotch.....	10.25 @ 10.50
Ohio Strong Softeners No. 1.....	13.00 @ 13.50
Southern Silvery, No. 1..... @ ...
Southern Silvery, No. 2.....	10.75 @ 11.00
Southern Coke, No. 3.....	10.50 @ 10.75
Southern, No. 1, Soft.....	10.75 @ 11.00
Southern, No. 2, Soft.....	10.50 @ 10.75
Tennessee Charcoal, No. 1..... @ ...
Tennessee Charcoal, No. 2..... @ ...
Alabama Car Wheel.....	17.50 @ 18.00
Jackson County Silvery.....	15.25 @ 16.00
Other Ohio Silvery.....	14.25 @ 14.50
Coke Bessemer.....	11.25 @ 11.50
Malleable Bessemer.....	10.5 @ 11.25

Bars.—Manufacturers of Bar Iron have had a comparatively good week, orders being considerably in excess of those of the previous week. Inquiries are improving, and prospects are favorable for a larger trade in the near future. Season contracts have been rather few of late, and only one is known to have been placed since last report. An inquiry is in the market for 2000 Car Axles. Common Iron from Old Rail mixture is quite firm at 1.10¢ @ 1.12½¢, Chicago, for mill shipment. Guaranteed Iron is stiffer, and now appears to be held at 1.22½¢, Chicago. Soft Steel Bars from strictly Billet stock continue to be quoted at 1.30¢ @ 1.35¢, Chicago, but the demand is not large. The great difference in price is again diverting the attention of buyers to Bar Iron. Jobbers report a good demand from store for small lots, which are quoted at 1.25¢ up-

ward for Iron and 1.40¢ upward for Soft Steel.

Structural Material.—Several orders for bridges have been placed by Western railroad companies, but Eastern bridge works have been successful in securing the contracts. A bridge at Red Wing, Minn., will be let early in August, which will take about 500 tons of material. A few more small bridge contracts are in sight. Orders for Beams and other Building Shapes have been small but fairly numerous. Quotations on mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.50¢; Tees, 1.65¢; Angles, 1.45¢; Universal Plates, 1.45¢. Small lots from stock sell at 1.90¢ @ 2.25¢ for Beams and Channels; 1.50¢ @ 1.80¢ for Angles, and 1.70¢ @ 1.80¢ for Tees.

Plates.—Manufacturers' agents and dealers report trade very dull. Mill shipments, Chicago delivery, are quoted as follows: Tank Steel, 1.45¢ @ 1.55¢; Flange Steel, 1.65¢ @ 2.10¢; Fire Box, 1.65¢ @ 5¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.80¢ @ 1.90¢; Tank Steel, 1.65¢ @ 1.85¢; Flange Steel, 2¢ @ 2.15¢; Boiler Tubes, in carloads, 70% @ 75% off.

Sheets.—Both Black and Galvanized Sheets are in only fair demand from the general trade, being less active than last week. Mill shipments of No. 27 Common are held at about 2.40¢ @ 2.45¢, Chicago; No. 27 Soft Steel at 2.50¢ @ 2.55¢, and Galvanized sheets at 77½% @ 80% off; Sheet Copper, 14¢, with no discount. Small lots of No. 27 Common from stock are selling at 2.60¢ @ 2.70¢, and Galvanized Sheets at 75 and 5%.

Merchant Steel.—The condition of business is about the same as previously reported. Season contracting is still in progress and the demand from general consumers is for small lots. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.65¢ @ 1.75¢; Smooth Finished Tire, 1.60¢ @ 1.70¢; Open Hearth Spring Steel, 1.85¢ @ 1.90¢; Bessemer Machinery, 1.50¢ @ 1.55¢; Bessemer Tire, 1.40¢ @ 1.45¢; Ordinary Tool Steel, 5½¢ @ 7¢; Specials, 10½¢ and upward.

Billets and Rods -- Inquiries for Billets have been light. The Joliet Works are now in operation and local consumers are again being supplied. Quotations are continued at \$18.25 @ \$18.50. Good contracts for Wire Rods are in sight and it is expected that considerable business will soon be entered. Prices are held at \$25 @ \$25.25.

Rails and Track Supplies.—The local Steel Rail mill is again in operation, and from present appearances will continue to be operated steadily until at least well into the fall. Small orders only have been booked in the past week, but they are coming steadily. Quotations are continued as follows: Standard Rails, \$25 @ \$27; Steel Splice Bars, 1 25¢ @ 1.35¢; Track Bolts, with Nuts, 2 10¢ @ 2.15¢; Spikes, 1 75¢ @ 1.80¢; Links and Pins, 1.65¢ @ 1.70¢.

Old Rails and Car Wheels.—An offer by a local dealer of \$10.50 for a small lot of Old Iron Rails was refused by a railroad company. The asking price appears to be generally \$11. Old Steel Rails are quoted at \$7.75 @ \$10, according to length and selection. Nothing has been done lately in Old Car Wheels, which are quoted at \$10 @ \$10.50.

Scrap.—The demand is very limited from consumers, but dealers have not entirely lost all hope and are taking in material when they secure it at bargain prices. Dealers quote the following selling prices \$ per net ton: Railroad Forge, \$9; Dealers' Forge, \$8 @ \$8.50; No. 1 Mill, \$6.50; Pipes and Flues, \$6; Iron Axles, \$12.25 @ \$12.50; Steel Axles, \$12.75 @ \$13; Heavy Cast, \$7 @ \$7.50; Stove Plate, \$5 @ \$5.50; Fish Plates, \$9.50; Horseshoes, \$9; Mixed Steel, gross ton, \$5.50.

Metals.—Copper is quiet and unchanged at 9½¢ for carload lots of Lake and 9¢ for casting brands. Spelter is dull at 8.25¢. Pig Lead is now firm at 3.40¢, with sales of several hundred tons during the week at 3.35¢ @ 3.40¢. Holders are now making no offerings.

D. L. Cobb, formerly a member of the firm of Hugh W. Adams & Co. of New York, has been appointed sales agent at Chicago for the Sloss Iron & Steel Company of Birmingham, Ala. His office for the present is in room 1402 Monadnock Building.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., July 31, 1894.

The slight improvement noted a week ago appears to be further confirmed by the events of the past few days. There is less difficulty in making sales and less difficulty in securing full prices, which, with a continuous run of small orders, makes the outlook better than we have seen at any time within a year. Compared with 1892 there is a wide difference, both in prices and in the amount of business to be had, but the encouraging feature is that things are not as bad as they were three, six or nine months ago, while there are pretty substantial reasons for believing that the improvement will be maintained. The West appears to have business to keep them from flooding the Eastern markets, although they might do so on a higher level of prices, but at current quotations competition is not particularly close. At all events nobody seems to care to take business at anything materially less than ruling rates, hence it may be assumed that with both East and West business is in much better shape.

Pig Iron.—There is not an unusually heavy demand for Pig Metal, but from general indications it seems probable that the demand exceeds the supply. This has not been to an extent to affect prices, but in the long run it must do so, unless there is some change in the proportions. Low priced Irons are very closely taken up, and while there is no real scarcity of other grades, the supply is small enough to enable holders to be very firm in regard to prices. There is a good deal of discrepancy in quotations, nevertheless some seem to have an idea that if they ask 25¢ advance they will lose their trade, and under a little pressure are not hard to persuade to make a concession. This is the exception, however, as the majority are inclined to stiffen up on quotations, and so far have done it with a fair degree of success; and as conditions are likely to favor them, there is no reason why there should not be better prices all around. Bessemer is still very scarce, and would probably bring \$13.50 @ \$14, but there is none on the market, so that prices are mainly a matter of opinion. Sales of Low Phosphorus have been made to the extent of probably 1500 tons at \$17 @ \$17.50,

but the supply and demand are both somewhat limited at present. General quotations for Philadelphia and near-by points are about as follows:

Bessemer.....	Nominal, \$13.50	@ \$14.00
Standard No. 1 Foundry X	12.50	13.00
Standard No. 2 Foundry X	11.50	12.00
No. 2 Plain.....	10.75	@ 11.00
No. 1 Soft.....	11.50	@ 11.75
No. 2 Soft.....	10.75	@ 11.00
Standard Gray Forge.....	10.50	@ 10.75
Ordinary.....	10.25	@ 10.50

Muck Bars.—Buyers at about \$19.50 f.o.b., sellers at \$20 @ \$20.50. There is more interest shown in regard to this article, and it looks as though there might be considerable activity after a while, and possibly better prices than buyers are now willing to pay.

Steel Billets.—There is more disposition to buy, but the views of buyers and sellers are too far apart to permit of much business being done. Deliveries that were suspended during the strike are now being made, and until these are completed it is not likely that consumers will be willing to place large orders. Sellers ask \$19.50 @ \$19.75, buyers bid \$18 @ \$18.50, for any deliveries during 1894, with a few sales for prompt shipment at \$19.50 @ \$19.75. A bid of \$19.15 was refused for 1000 tons, August shipment, although for a later delivery that figure could probably be shaded a little.

Finished Material.—All that can be said under this heading is that the improvement noted a week ago is fully maintained. The demand has been large enough to cause a further accumulation of orders at the mills, but as several are now running on full time, and others are getting ready for a larger business, it will probably prevent any upward movement in prices. The small trade keeps up remarkably well, and as 2000 or 3000 tons of bridge material for city work has been virtually placed to-day manufacturers feel quite hopeful in regard to the future. It is not definitely known where the work will go, but it is probable that the Edge Moor, Pencoyd and Phoenix will each get a portion, although some of the Plates may be supplied from Pittsburgh. Prices are the same as quoted a week ago and, as a rule, firm, but in competing for special orders it is noticed that figures show a wide divergence from ordinary quotations, which are about as follows, delivered:

Grooved Skelp.....	1.25¢	@ 1.30¢
Standard Refined Bars	1.25¢	@ 1.35¢
Medium quality.....	1.15¢	@ 1.20¢
Tank Steel.....	1.35¢	@ 1.45¢
Heavy Plates.....	1.30¢	@ 1.40¢
Shell.....	1.50¢	@ 1.60¢
Flange.....	1.60¢	@ 1.80¢
Angles.....	1.40¢	@ 1.50¢
Beams and Channels	1.50¢	@ 1.60¢

Old Material.—Demand improving, but no change in prices, which are usually quoted as follows:

Heavy Melting Steel.....	\$10.00	@ \$10.50
Light Melting Steel.....	8.00	@ 8.50
No. 1 Wrought Scrap.....	10.50	@ 11.00
Machinery Cast.....	9.50	@ 10.00
Wrought Turnings.....	8.00	@ 8.50
Cast Borings.....	6.25	@ 6.75
Old Iron Rails.....	11.50	@ 12.00
Old Car Wheels.....	9.50	@ 10.00

Eastern pig iron tariff No. 7 of the Queen & Crescent Route, effective July 23, fixes the following rates on Southern pig iron: From Dayton and Rockwood, Tenn., to Allentown, Pa., \$4.20; to Bellefonte, Pa., \$4; to Columbia, Pa., \$4.27; to Easton, Pa., \$4.62; to Wilmerding, Pa., \$3.30, and to Trenton, N. J., \$4.62. From Chattanooga, Tenn.: \$4.45, \$4.25, \$4.27, \$4.62, \$3.50 and \$4.62, respectively. From Rising Fawn, Ga., and

Fort Payne, Ala.: \$4.70, \$4.50, \$4.52, \$4.87, \$3.75 and \$4.87, respectively. The rates are the same from the Birmingham district as from Rising Fawn and Fort Payne, except in the case of Wilmerding, where it is \$4.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, July 31, 1894.

The Valley furnace operators are up in arms against the Coke makers for not giving them Coke, and a delegation of them is in Pittsburgh to-day to confer with the leading Coke interest to see if something cannot be done to better their condition. From one standpoint Bessemer Iron at \$12 @ \$12.50 and Billets at \$17 @ \$17.50 are much more inviting than Coke at \$1 @ \$1.10 per ton, especially in view of the fact that it is costing close to \$3 per ton to make it. Reliable reports from the Connellsville region to-day show that the situation now is not as favorable as it was last week, many of the negroes having deserted and gone back to the South. General business shows little change over last week. Beams are a shade higher, but Bars are slightly weaker. Small lots of Billets are being sold for prompt delivery, but nothing is doing for extended deliveries. There are some inquiries in the market for Rods, and some sales have been made at \$24 or thereabouts.

Pig Iron.—The only furnaces in the two valleys that are in operation to-day are Rosena, at New Castle, and Stewart, at Sharon. Douglas, at Sharpsville, will go in this week, using Latrobe Coke. There is a fair demand for prompt Bessemer Iron, coming principally from Steel plants whose production of Pig does not come up to their converting capacity. Nothing is doing in Bessemer for late delivery, the Valley furnaces having no assurance as yet of getting Coke in the near future, and buyers are not willing to purchase "subject to shipment after the Coke strike is ended." There is somewhat of a scarcity in Gray Forge, and while the demand is very limited, prices are firm on the basis of \$9.85 @ \$10, Pittsburgh. Foundry Iron continues dull in demand, and prices are unchanged. We quote as follows for forward delivery:

Neutral Gray Forge.....	\$9.85	@ \$10.00, cash
All-Ore Mill.....	9.75	@ 10.00 "
No. 1 Foundry.....	11.75	@ 12.00 "
No. 2 Foundry.....	10.75	@ 11.00 "
Bessemer.....	11.65	@ 11.75 "

We note a sale of 500 tons of spot Bessemer at \$12.25, Pittsburgh, and 300 tons of Gray Forge at \$9.85, Pittsburgh.

Ferromanganese.—Is unchanged at \$53, delivered.

Billets.—A moderate amount of Steel for prompt delivery is changing hands, but sales are confined entirely to small lots. Large buyers who usually purchase in lots of 5000 or 10,000 tons are buying 1000 tons and when this is used they buy again. Were the Coke strike to end suddenly, which is not probable, however, and the blast furnaces to start up, it is not unlikely that Steel would decline to some extent, but with the dubious outlook in the Coke region, Billets are likely to bring good prices for some time yet. For prompt delivery \$17.50 is the ruling quotation, while for the next three months \$17 @ \$17.25 is asked. We note two sales of Billets of 500 tons each at \$17.50, Pittsburgh, for August delivery and one of 1500 tons for August and Sep-

tember delivery at \$17.25 at maker's mill.

Structural Material.—Beams are showing a firmer tendency and 1.30¢, Pittsburgh, for round lots, is the ruling price and 1.35¢ for ordinary business. No large contracts are being placed, but there is a good run of small orders and the two local mills have all they can do. We quote as follows: Beams and Channels in round lots, 1.30¢ at mill. In small lots, 1.35¢ @ 1.40¢, according to order. We quote Angles and Universal Plates at 1.25¢ @ 1.35¢, and Tees 1.40¢ @ 1.50¢.

Plates.—Trade continues fair, the demand being for small lots only. Prices are without material change and we continue to quote Tank Steel at 1.20¢ in round lots and 1.25¢ @ 1.30¢ for ordinary business; Shell is ruling at 1.40¢ @ 1.45¢ and Flange at 1.50¢ @ 1.60¢; Ordinary Fire Box, 2½¢ @ 3¢; Railroad Fire Box, 3.35¢ @ 3.50¢.

Muck Bars.—Prices have gone off about 50¢ \$ ton and we now quote \$19 @ \$19.25, delivered, for best grades. We note a sale of 75 tons at \$19.25, Pittsburgh.

Bars.—Last Saturday was pay day at some of the Valley mills and more money was distributed than at any time within the last year. The volume of business is heavier, some season contracts having been placed lately. Prices are hardly as firm as they were and 1.05¢ at Valley mill for Iron Bars is being shaded for desirable orders. We quote Steel Bars from all Billet stock at 1.05¢ in round lots and 1.10¢ @ 1.15¢ in smaller quantities, with Bar Iron extras.

Merchant Steel.—A good many season contracts have been placed and others are under negotiation. Buyers are not buying in as large quantities as they did last year, although prices are considerably lower. We quote as follows: Bessemer Machinery, 1.30¢ @ 1.35¢; Open Hearth Spring, 1.65¢ @ 1.70¢; Open Hearth Machinery, 1.45¢ @ 1.55¢; Machine Straightened Tire, 1.60¢ @ 1.65¢; Cold Rolled Shafting, 2.30¢ @ 2.35¢; Tool Steel, 5¢ @ 7¢ for ordinary grades; 11¢ @ 13¢ for extra grades.

Wire Rods.—Some fair sized orders have been placed, but a number of good sized inquiries are still in the market. It is stated that with Steel at \$17.50 an allowance of \$6.50 for rolling should be made to insure a fair profit, which would make the price of Rods \$24, at mill. We are advised of a sale of 1500 tons at a price equal to about \$23.75 at maker's mill. We quote at \$24 for good sized orders, while for small lots \$24.50 is asked.

Wire Nails.—The market is without special feature, the demand being light and prices unchanged. Stocks of Wire Nails throughout the country are very light, one maker putting the amount at 150,000 kegs, and if a good fall trade should come it is not improbable better prices will rule. We quote at \$1.10 in carload lots and \$1.15 in less quantities. The demand for Cut Nails is also light, but prices are firm on the basis of 95¢ at mill, in carload lots, for the usual averages.

Barb Wire.—Some orders for fall delivery have been placed and more would have been placed had manufacturers been disposed to shade prices to secure trade, which they are refusing to do in the belief that prices are about as low as they will go and may improve with a heavier demand. It is reported

that a pooling arrangement among the Wire makers, such as exists in the Wire Nail trade, is on foot. We quote Four-Point Galvanized at \$2.05 @ \$2.10 in carload lots and Plain Wire at \$1.50 in carload lots.

Sheets.—There is a good demand from the smaller trade, but the large buyers seem to have covered their requirements. Prices are firm and we quote No. 27 Common Iron at 2.30¢ @ 2.35¢ and Steel at 2.40¢ @ 2.45¢; Galvanized Iron is ruling at 75 and 10% discount for good-sized orders and 75 and 5% for small orders.

Skelp Iron and Steel.—There is nothing new to report and we repeat former quotations, as follows: Grooved Steel Skelp, 1.10¢ @ 1.15¢; Sheared Steel Skelp, 1.20¢ @ 1.25¢; Grooved Iron Skelp, 1.20¢ @ 1.30¢; Sheared Iron Skelp, 1.35¢ @ 1.40¢.

Pipes and Tubes.—The demand for Pipes and Tubes is quite active and prices are being well sustained. Several Pipe line contracts that were expected to be let before this have been postponed.

Connellsville Coke.—Again we have to report that the situation in the Connellsville region is not as favorable this week and to many it would not be a surprise if a general cessation from work should take place at any time. The negroes are reported as leaving in large numbers lately and this naturally stiffens up the backbones of the strikers. A delegate meeting was held last week and it was decided by an almost unanimous vote to continue the strike. The prospects for the Valley furnaces getting Coke for a considerable time yet are far from encouraging.

The offices of Jos. Dreifuss, dealer in Iron and Steel Scrap, have been removed from the Standard Building, Pittsburgh, to Second National Bank Building, Ninth and Liberty streets, Pittsburgh, Pa.

The offices of Goff & Horner, Iron and Steel factors, have been removed from room 406 Lewis Block, Pittsburgh, to rooms 308 and 309 in the same building.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts., Cincinnati, August 1, 1894.

While the volume of business has been small during the week, there has been some gain in confidence, for the volume of business during the month of July was quite as large as in June and somewhat better prices have been obtained. The Southern furnaces have not much Iron to sell and those which have some Iron on hand are holding it out of market because they are convinced they will be able to get better prices later in the season. There are ample offerings of No. 1 Foundry, but there is not much demand for this grade, while No. 1 and No. 2 Soft are scarce and in good demand. No. 2 Foundry is selling fairly well on the basis of \$7.25, f.o.b. Birmingham, but there is little Gray Forge or Mottled Coke Iron offered. There has been about the usual jobbing trade for single carloads in this district and some inquiry for the Pittsburgh district, but generally at lower prices than the furnaces would accept. The Iron Pipe works are melting considerable Iron, but are obtaining

it on old contracts. All parties are looking for a revival of general trade and are impatient at the delay in passing the tariff bill in some shape. Prices of Iron are without quotable change. Quotations are as follows:

Foundry.

Southern Coke, No. 1	\$10.25 @ \$10.50
Southern Coke, No. 2	9.50 @ 9.75
Southern Coke, No. 3	9.25 @ 9.50
Ohio Soft Stone Coal, No. 1	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2	14.00 @ 14.50
Lake Superior Coke, No. 1	12.50 @ 13.00
Lake Superior Coke, No. 2	11.50 @ 12.00
Hanging Rock Charcoal, No. 1	16.00 @ 17.00
Hanging Rock Charcoal, No. 2	15.50 @ 16.00
Tennessee Charcoal, No. 1	18.00 @ 18.50
Tennessee Charcoal, No. 2	12.00 @ 12.50

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable	16.25 @ 16.75

Forge.

Gray Forge	8.75 @ 9.00
Mottled Coke	8.50 @ 8.75

St. Louis.

(By Telegraph.)

Office of *The Iron Age*, Bank of Commerce Building, St. Louis, August 1, 1894.

Pig Iron.—The situation does not show any material change. The scarcity of No. 1 Soft and No. 2 Foundry Irons referred to in our last report still continues and prices of these two grades are firmer in consequence. Consumers are beginning to take some interest and there are more inquiries in the market to-day than there has been for some time past. The output is not heavy and there are no large stocks of Iron on the furnace banks. The general situation is steadily improving and some effect is likely to be felt in prices before many days. We quote as follows for cash, f.o.b. cars St. Louis :

Southern Coke, No. 1 Foundry	\$11.00 @ \$11.25
Southern Coke, No. 2 Foundry	10.50 @ 10.75
Southern Coke, No. 3 Foundry	9.75 @ 10.00
Gray Forge	9.50 @ 9.75
Southern Car Wheel	16.50 @ 17.00
Ohio Softeners	14.00 @ 14.50

Bar Iron.—The past week has been a satisfactory one so far as volume of business is concerned. Jobbers are replenishing their stocks and Car manufacturers and the railroads have also been placing some good orders. The market is firm at 1.15¢ @ 1.20¢, for carload lots from mill. Jobbers quote 1.30¢ @ 1.35¢, according to quantity.

Barb Wire.—Notwithstanding the fact that this is the dull season in this department a fair trade is reported. The combination among the manufacturers expires September 1, and steps are already being taken to continue the agreement which has been satisfactory to all concerned. Local mills quote Painted, in carload lots, \$1.90, with 40¢ \$ hundredweight additional for Galvanized.

Wire Nails.—Mills quote carload lots at from \$1.20 to \$1.25, and report a fairly active demand at these prices. Jobbers are also busy, and inquiries point to a steady trade.

Rails and Track Supplies.—Railroads are becoming more liberal in the placing of orders for material and an active trade in this department is the result. Splice Bars and Bolts are in good demand and inclined to be a trifle firmer. We quote as follows: Splice Bars, 1.35¢; Spikes, 1.70¢ @ 1.75¢; Bolts, Square Nuts, 2¢; with Hexagon Nuts, 2.10¢; Steel Liukas and Pins, 1.60¢; Iron, 1.70¢; Steel Rails are quiet

at \$26 @ \$27, and Old Iron Rails are unchanged at \$10 @ \$10.50.

Pig Lead.—The movement in Pig Lead continues to show increased strength and several hundred tons have changed hands. Sales to day were made at 3.87½¢, with bids of 3.40¢, but no offerings. The demand is of a legitimate character, and as there are no surplus stocks to draw from still higher prices are anticipated.

Spelter.—At 3.20¢, this metal is stationary. There is not much doing, however, and sales are limited to car-load lots. At this writing the outlook is not encouraging for any early advance.

Birmingham.

BIRMINGHAM, July 30, 1894.

Midsummer dullness does not sufficiently characterize the situation; it is too mild a term. The market is in a very peculiar condition. On the one hand the furnaces claim to be asking from \$8 for No. 1 Soft and No. 2 Foundry on new orders, while on the other hand it is reported that less than \$7 was paid for a round lot, some 2500 tons, of these grades. While this has not yet been authenticated, the impression was given that it was Birmingham Iron. It does not appear reasonable that any such low price should be accepted when stocks of iron are in such a low state, yet the rumor shows the peculiar unsettled state of affairs. Small orders are plentiful, but furnaces claim to be firm in refusing to sell ahead or make immediate delivery below quotations given. No. 1 Foundry is quoted at \$8.50 @ \$9; No. 1 Soft and No. 2 Foundry, \$7.50 @ \$8; No. 3 Foundry, \$6.75 @ \$7; Gray Forge, \$6.50 @ \$6.75. The Tennessee Coal, Iron & Railroad Company have not blown in any more furnaces, neither have Sloss Iron & Steel Company. Coke ovens are kept hot, but not sufficient coal is mined beyond what is necessary to supply current furnaces and contracts. It is doubtful if much improvement will take place until after August 6. State elections for Governor and Legislature take place on that date, and the whole present agitation and continuance of the miners' strike smacks strongly of election maneuvers. It is believed the men will then accept 40¢ if offered. The smaller mines are paying 45¢ @ 50¢ and running fairly full time, with little interference and improving quality.

Comment has been caused by the fact that some less advantageously equipped plants seem to be preparing to go in blast. A great deal of this is in shape of preparatory inquiry and discussion and may lead to nothing. It must not be forgotten, however, that now is a good time to make repairs cheaply, and that most of those smaller plants that propose going ahead are unincumbered with high priced contracts for raw materials and freights, and can get the full benefits of the low prices and rates now ruling, while some of those best managed plants have raw material contracts at figures which make it unprofitable to go ahead at present. This, however, is not a condition of the market, but rather of mistaken policy in making long time contracts at higher prices, which some of the less well equipped plants have avoided. The rolling mills here are still closed. The Birmingham mill is expected to open soon, the Alabama will probably not before the end of August.

As to the future outlook opinions differ. With a production of about

10,000,000 tons of Iron in 1892 cut down to about 5,000,000 now, it would appear that, with but a slight approach to the normal, an advance of 50¢ @ \$1 should obtain, especially in view of low stock in consumers' hands. There seems, however, to be no apprehension on the part of consumers of any danger in the situation. Perhaps there is none, as the general outlook would indicate a general resumption of consumers coincident with an increased Pig Iron production until a more normal condition prevails, when prices can advance more permanently. The same applies to railroad material, although at no time have the roads run as close to the danger line on repairs to rolling stock. This is plainly manifest by the many returns of transfers and delays caused by breakdowns, which greatly exceed those reported in former years. The railroads can be counted on to be large customers after they get on their feet again and out of receivers' hands. It is also questionable whether the low Ore and Coke prices in the North and Northwest are permanent, and any increase in price of raw material and rates of freight to the Northern furnaces gives us here that much more margin when the materials are close at hand and mainly controlled by the furnaces.

Rumor has it that there will be further changes in the Tennessee Coal, Iron & Railroad Company, among which is the promotion of John Dowling to general superintendence of all furnaces. This would be a step in the right direction and a worthy acknowledgment of merit. By the by, *The Iron Age* is being highly complimented on its varied and interesting reading matter of late. The discussions on Steel and allied subjects have attracted much attention and interest here as bearing most strongly on the greatest need of the South: a successful steel plant.

Financial.

The business situation generally exhibits little or no change from that outlined in last week's report. The same factors—tariff uncertainty, heavy gold exports and the steady shrinkage in the Government reserve of the metal—continue to exercise a depressing influence in financial and mercantile circles; and to them has been added this week the further unfavorable feature of disquieting news in regard to Western crop prospects. The trade of the country remains in a condition of lethargy, awaiting more encouraging developments, and the advent of the longed-for favorable turn in affairs appears to be as far off as ever. The deadlock in the Tariff Conference Committee at Washington continues unimpaired. Rumors of all kinds have been rife as to weakening on either side, but so far nothing reliable can be learnt as to the probable fate of the measure; the result remaining as much a matter of speculation as ever. Under existing circumstances any general revival of activity is out of the question. There is no doubt, on the other hand, that the disposition of the tariff question would be followed by an immediate improvement in business circles, in whatever guise the settlement might come.

The outflow of gold to Europe reached the sum of \$5,300,000 last week and \$500,000 more were sent on Tuesday, making a total of about \$10,500,000 sent abroad during the month of July, a month when, under normal conditions, no such export movement of

specie should occur. The reason for the present abnormal outgo of gold is the scarcity of bills of exchange and the continued strength of rates. Should these conditions continue in force during the next few days, further shipments of large amount will be made by the outgoing steamers later in the week. It is estimated that at least \$2,000,000 will be required for Thursday. All of this coin is drawn from the Treasury, with the consequence that the available Government gold reserve is now down to \$55,000,000, with the prospect of reaching the \$50,000,000 mark within a few days. This depletion of the gold reserve is regarded as serious by business men, and the necessity for its fortification by another bond issue is again being freely urged on the Treasury authorities. No relief can be looked for in the direction of internal revenue or customs receipts, as the proportion of gold received on these accounts continues almost insignificantly small.

Wall street reflects the general stagnation, which the heat of the weather has tended to intensify. For the greater part of the week under review dealings on the Stock Exchange have been tame, except in sugar certificates and the granger roads. Sugar stocks, as usual, have shown active fluctuations, as rumors from Washington have been favorable or otherwise to the interests of the trust. The granger stocks, led by Burlington, declined heavily toward the close of last week on reports of injury to the Western corn crop. The decline, which continued on Monday, was followed by a slight reaction on Tuesday. Burlington stocks have been additionally depressed by the report of the earnings of the road, which show a considerable decrease. Altogether the stock has lost nearly five points during the week, with some heavy selling on Monday. St. Paul and Rock Island also show a decline. A sensational fall of 11 points in Consolidated Gas shares on Monday was attributed to the expected sharp competition of the East River Gas Company, who have recently completed their tunnel under the East River. Tuesday's market closed dull and featureless.

The weekly statement of the New York banks, published on Saturday, was interesting as showing for the first time for months a heavy decrease in deposits, amounting to over \$5,000,000, which is accounted for largely by the gold exports. Loans decreased over \$1,000,000, and the surplus reserve, as the result of all changes, shows a shrinkage of \$2,210,000, standing now at a little under \$72,000,000. The loan market exhibits little change. Call money still rules at 1%; and the demand for time loans shows no improvement, while the supply is abundant. Rates are quoted at 1% for 30 days, 1½% for 60 days, 2% @ 2½% for 90 days to four months, 3% for five to seven months. There is a rather better offering of commercial paper, but all material of desirable quality is readily absorbed, the ruling rates being 3% for indorsed bills, 3% @ 3½% for high grade single names, 4% @ 5% for others.

Sterling exchange rates have been strong and higher, closing on Wednesday at about the figures at which the former heavy gold shipments were made, and assuring a large demand for gold for export toward the close of this week, unless the supply of bills increases materially in the meantime. Grain bills have been very scarce. Actual business was done on Wednesday at \$4.87½ for 60 days, \$4.88½ for de-

mand, \$4.89 for cables and \$4.86 $\frac{1}{2}$ @ \$4.86 $\frac{1}{2}$ for commercial.

Domestic exchange on New York is quoted as follows: New Orleans, commercial par, bank 75 premium; Savannah, buying par, selling $\frac{1}{2}$ premium; Boston par @ 3¢ premium; Charleston, buying at par, selling $\frac{1}{2}$ premium; San Francisco, sight 12 $\frac{1}{2}$, telegraph 15; Chicago, 10¢ premium.

A sensational rise in the price of corn has taken place during the week on reports of inquiry to growing crops from the heat. On Tuesday, however, a reaction set in with more reassuring news, and the grain closed lower at the finish. Wheat advanced 2¢ a bushel early in the week on similar unfavorable news, but late reports of rain in the most parched districts induced a weaker tone on Tuesday. Chicago advises of July 31 report that the visible supply of wheat had increased 3,373,000 bushels, and corn increased 325,000 bushels. Crop indications on the whole are quite favorable. There are no signs of any serious damage either to corn, wheat or cotton.

Metal Market.

Pig Tin.—The market has been dull and heavy throughout the week. Free arrivals, hardly average consumptive demand and almost entire absence of speculative interest, along with reported heavy shipments from the Straits the past month, combined to more or less seriously affect the market. As it is, sales are difficult to make of round lots at 18.75¢ for prompt or August delivery on net cash terms at the present time, although official records had sales recorded at 18.80¢ a few days ago. Jobbing parcels are still being sold at prices very close to those quoted for round lots. The importations this month have been about 1500 tons, or considerably in excess of the estimated consumption. Straits' shipments were heavy also, including 3300 tons to Great Britain and America and 600 tons to the Continent, against a total of 2425 tons for the corresponding period last year. The amount of Tin in sight would thus appear to have increased several hundred tons, leaving the statistical position worse than it was a month ago. The visible supply for Europe and America is now estimated at nearly 21,000 tons. A year ago it was about 15,000 tons.

Copper.—There has been no distinctively new movement. Most of the Lake Superior producers are well sold ahead and busily engaged making deliveries on old contracts. The Montana and Arizona companies doubtless lost custom by what may be termed the "drive" recently made by prominent Lake Superior concerns, but they make a showing of indifference and work in a secretive way that is not only suggestive but which encourages the idea that matters are not as smooth as represented. However, it is no difficult matter to purchase Lake Superior Ingots at 9.10¢, and there are some indications that a lower rate would be accepted, although 9.15¢ upward is generally asked. Electrolytic may fairly be quoted at 8 $\frac{1}{2}$ ¢ @ 8 $\frac{1}{2}$ ¢, and ordinary casting stock at 8 $\frac{1}{2}$ ¢ @ 8 $\frac{1}{2}$ ¢, according to brand.

Pig Lead.—While the extreme prices reached last week for spot stock have not been duplicated, except in remote instances, the market still shows very firm tone, and it is doubtful if car lots can be purchased below 3.65¢ at this writing. In bids for August delivery there has been a rise to 3.60¢ @

3.62 $\frac{1}{2}$ ¢, and few sellers, if any, will shade the spot price. Limited supplies check business here, but quite liberal purchases have been made in the West of stock for shipment during the next 30 days.

Spelter.—Of ordinary brands of common Western carload lots have been sold at 3.45¢ @ 3.50¢, chiefly at the lower rate, delivered here or at common point. There were rumors of sales at as low as 3.40¢, but these could not be confirmed. On the surface, however, the market has a weaker appearance, and the offering of stock for early shipment from primary points is freer than it has been for some time past, which would indicate that more or less accumulation of stock at smelting works has taken place recently.

Antimony.—Jobbing trade is moderate and prices are about holding their own. Spot figures are 8 $\frac{1}{2}$ ¢ @ 8 $\frac{1}{2}$ ¢ for Hallett's and 10¢ for Cookson's.

Nickel.—The market is rather slow, with 40¢ about the best rate for round lots and the usual advance quoted for small quantities.

Tin Plate.—No improvement has taken place in the volume of business or in the character of orders. It has been almost a hand to mouth business, since consumers outside of the large ones engaged in export business, who receive a drawback, are extremely careful pending the outcome of tariff legislation. The spot business passing is mainly at about the following prices: Charcoal, Melyn grade, IC, \$6; do., Melyn grade, Crosses, \$7.75; do., Allaway grade, IC, \$5.40; do., Allaway grade, Crosses, \$6.45; do., Grange grade, IC, \$5.50; do., Grange grade, Crosses, \$6.60; do., Terne, M.F., 14 x 20, \$7.25; do., M.F., 20 x 28, \$14.50; do., Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11; Allyn grade, 14 x 20, \$5.15; do., 20 x 28, \$10 @ \$10.25; D. R. D. grade, 14 x 20, \$4.90; do., 20 x 28, \$9.70. IC Coke: Penland grade, \$5; do., J. B. grade, 14 x 20, full weight \$5.15; do., 100 lb. \$4.75; do., 95 lb., \$4.62 $\frac{1}{2}$; do., 90 lb., \$4.55. IC Bessemer Steel, Coke finish: 14 x 20, full weight, \$5.12 $\frac{1}{2}$; do., 100 lb. \$4.70 @ \$4.75; do., 95 lb., \$4.60; do., 90 lb., \$4.50. IC Bessemer Steel, Coke finish, sq., \$5.30. IC Siemens Steel, Coke finish, sq., \$5.45. Wasters: S. T. P. grade, 14 x 20, \$4.60; do., S. T. P. grade, 20 x 28, \$9; do., Albecarne grade, 14 x 20, \$4.90.

New York.

Office of *The Iron Age*, 98-102 Reade street, NEW YORK, August 1, 1894.

Pig Iron.—Business in this section continues exceedingly dull. In that part of the state north of Albany and Troy the Buffalo producers are making low prices. The stove trade is spoken of as very dull, while the makers of water works supplies are busy and the machine shops are doing a fair amount of work. We quote standard brands \$12.50 @ \$13 for No. 1; \$11 @ \$12 for No. 2, at tidewater. Southern Iron, same delivery, \$11.50 @ \$12.25 for No. 1; \$10.50 @ \$11 for No. 2; \$10 @ \$10.25 for No. 3; \$10.25 @ \$10.75 for No. 2 Soft, and \$10.50 @ \$11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$9.75 @ \$10.25.

Spiegeleisen and Ferromanganese.—No transactions of any consequence are reported in foreign. We quote foreign Ferromanganese nominally \$52 @ \$53 for 80%, at tidewater.

Billets and Rods.—The market is dull at \$19.50 @ \$20, tidewater, for domestic Billets, and \$27 @ \$27.50 for Wire Rods.

Steel Rails.—We note sales aggregating about 3000 tons by an Eastern mill, the largest business done for some time. We continue to quote \$24.80, tidewater, for standard sections.

Track Material.—We quote as follows for small lots: Spikes, 1.50¢ @ 1.70¢; Fish Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 2¢ @ 2.10¢, and Hexagon Nuts, 2.10¢ @ 2.30¢, delivered.

Manufactured Iron and Steel.—No large work has been given out. There is a fair volume of small orders for prompt shipment, for which higher prices than our quotations are obtained. Plates are practically back to the level from which they started before the Coal and Coke strikes. We quote: Beams up to 15-inch, 1.40¢ @ 1.50¢ for round lots; Angles, 1.30¢ @ 1.35¢; Universal Mill Plates, 1.25¢ @ 1.35¢; Tees, 1.50¢ @ 1.60¢; Channels, 1.40¢ @ 1.50¢, on dock. Steel Plates are 1.25¢ @ 1.40¢ for Tank; 1.40¢ @ 1.50¢ for Shell; 1.60¢ @ 1.65¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.20¢ @ 1.20¢, on dock, and Common 1.10¢ @ 1.20¢; Soft Steel Bars are 1.20¢ @ 1.30¢; Scrap Axles are quotable at 1.35¢ @ 1.50¢, delivered; Steel Axles, 1.35¢ @ 1.50¢, and Links and Pins, 1.40¢ @ 1.60¢; Steel Hoops, 1.40¢ @ 1.50¢, delivered; Cotton Ties, 70¢ @ 75¢ # 45-lb bundle, tidewater; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.75¢ @ 1.90¢, and Sleigh Shoe, 1.60¢ @ 1.75¢, delivered.

Annealed Gray Iron Castings.—We have an inquiry from one of our readers for the address of some manufacturer of annealed gray iron castings. If there are any concerns making castings of this kind we shall be pleased to receive the information. The inquirer is not in search of malleable castings.

Taking effect on Wednesday, August 1, 1894, rates of freight on articles of iron and steel manufacture via rail and lake from Pittsburgh and points taking Pittsburgh rates to points named below will be as follows:

From Pittsburgh and points taking Pittsburgh rates to—	Group 1. Per ton.	Group 2. Per ton.
Detroit, Mich.	\$1.55	\$1.80
Junction Yards, Mich.	1.75	1.80
West Detroit, Mich.	1.75	1.80
Milwaukee Junction, Mich.	1.75	1.80
Bay City, Mich.	2.20	2.55
South Bay City, Mich.	2.20	2.55
West Bay City, Mich.	2.20	2.55
Saginaw, East Side, Mich.	2.20	2.55
Saginaw, West Side, Mich.	2.20	2.55

In the list of articles of iron and steel manufacture furnace castings have been changed to read, "Furnace castings, carload lots only," the change taking effect on Tuesday, August 7.

The last of the armor plates for the battleship "Maine," now building at the Brooklyn Navy Yard, has been received, and it is hoped that the vessel will be ready for her official trial trip within a few weeks.

British Metal Market.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, August 1, 1894.

Pig Tin prices have gone still lower, or to £65. 17/6 for prompts. The decline is attributed to lack of syndicate support and lowness of average of Banca sale at Amsterdam, which was equivalent to only £65. 10/. Banca recently ruled much above Straits. Intermediately there was some fluctuation and quite a large speculative turnover, mainly in closing up old deals, but at present there is little disposition to operate, in view of large shipments from the Straits. Dealings on Wednesday were at £65. 12/6 for prompts and £66 for three months' futures.

Copper prices have undergone very little change. There was a slight decline, in sympathy with general quietness, subsequently a slight rally, but no radical change in prices. Present prices for Merchant Bars are £38. 2/6 prompt delivery and £38. 12/6 three months' futures. Best selected English is quoted at £41.

In the Tin Plate market there has been very little change. Buyers are supplying only immediate wants, and while some makers quote slight concessions in order to keep mills going there is no radical change in prices. More inquiry is noted for oil sizes and a few lines were placed at below recent quotations. There is a doubtful feeling as to the future. Prices f.o.b. at Swansea are as follows:

Bessemer Cokes, 14 x 20.....	@ 10/
Siemens Cokes, 14 x 20.....	@ 10/3
Ternes, double box.....	@ 18/
Charcoals.....	11/ @ 18/

Pig Lead is a shade firmer at £9. 10/ for Soft Spanish, but sales have thus far been of routine character.

Selter is moving slowly, but prices are quite steady at £15. 12/6 for ordinary Silesian.

Pig Iron warrants have ruled slightly higher. Last quotations were at 42/ for Scotch, 35/6 for Cleveland, and 44/4 for Hematite.

The Lackawanna Iron & Steel Company of Scranton, Pa., have had in operation for two months an apparatus for loading rails on cars which has proved a marked success. It has a record of having loaded a 20 ton car in 7 minutes and has loaded 1200 tons in one day. It is automatic and requires the services of only one boy, while two men are on the cars to straighten out any rails which happen to slip down irregularly. We understand that the loader has saved the labor of 18 men.

The output of gold in the seven British Australasian colonies shows a steady increase year by year. In 1893 it is reported as 1,876,562 ounces, as compared with 1,796,130 ounces in 1892; 1,651,151 ounces in 1891; 1,599,350 ounces in 1890, and 1,739,750 ounces in 1889. Gold is found in each of the seven colonies, but Victoria headed the list last year in respect of the importance of

her production. Queensland ranked second; New Zealand, third; New South Wales, fourth; Western Australia, fifth; South Australia, sixth, and Tasmania, seventh.

Small Arms Tests at Newport.

The important competitive tests of small arms for the naval service, which began at the Naval Torpedo Station, Newport, R. I., on August 1, will be watched with much interest by foreign powers as well as by the naval and military authorities of this country. On the result of these trials will rest the decision of the Navy Department as to the best type of weapon with which to equip the sailors and marines of the United States Navy. In March last, Secretary Herbert issued a call to inventors for a breech mechanism to serve the small caliber, 0.256 inch, barrels adopted by the Naval Ordnance Department, and offering to furnish new barrels for experimental purposes. Twenty-seven of these barrels were furnished by the Government, many of them to leading makers of small arms. Considerable interest is expressed in the character of the various devices submitted. The first order for the new rifles will probably amount to 15,000 weapons, and it is believed that some important improvements in small arm efficiency are likely to have been called forth. The tests at Newport will be exceptionally severe, safety, general action, defective ammunition, excessive charges, rapidity, accuracy and ability to stand dust and rust entering into consideration. The endurance test will be 500 continuous rounds without cleaning, and the facility with which the breech mechanism and magazine system can be completely taken apart and put together will be noted.

According to the figures of the Bureau of Industrial Statistics, published at Harrisburg, Pa., the output of the bituminous coal mines of Pennsylvania last year was 43,421,898 tons, a decrease of 1,164,678 tons from the production of 1892. In the anthracite coal region the output was 47,179,563 tons, an increase of 1,444,169 tons over 1892. The number of men employed in bituminous mines in Pennsylvania was 81,800. In the anthracite region 78,789 is given as the number of miners.

Citizens of Baltimore, Md., are proposing to celebrate the centennial of the incorporation of the city, which occurs in 1897, by holding an industrial exhibition. The scheme is said to receive the enthusiastic support of the business men of Baltimore, as likely to be of great benefit to that important seaport, by directing general attention to its commercial and shipping advantages.

Annunciators, indicating the name of the next station, are in use on the cars of the Metropolitan and District suburban roads of London. They are set, after leaving a station, by pulling a cord. One official controls the apparatus in all the cars of a train simultaneously. This method is found a great improvement over the old indistinct shouting of the names of stations by the conductors.

Negotiations for an amalgamation of all the Russian petroleum interests are in progress at St. Petersburg.

CONTENTS.

PAGE.	
The Keating Pipe Yard. Illustrated.....	179
An Ancient Ironclad	179
The Production of Pig Iron	180
Report on the Working of a Siemens Furnace.....	181
A Large Engine Contract	184
Apparatus for Breaking Pig Iron. Illus. 184	
Western Foundrymen's Association. Ill. 186	
The Production of Bessemer Ingots and Rails.....	187
San Francisco News.....	187
Coal Mining in Illinois.....	188
The Week.....	188
Editorials:	
Pig Iron Statistics.....	189
The Debs Embargo and Primitive Methods of Transportation.....	189
Exhausting Smoke from Forges.....	189
Cheap Fire Box Steel.....	190
Washington News.....	190
Correspondence	191
Obituary.....	193
Personal.....	193
Manufacturing :	
Iron and Steel.....	193
Machinery	193
Hardware.....	194
Miscellaneous	194
The Iron and Metal Trades :	
Chicago.....	195
Philadelphia	196
Pittsburgh.....	196
Cincinnati.....	197
St. Louis.....	197
Birmingham.....	198
Financial.....	198
Metal Market.....	199
New York.....	199
British Metal Market.....	200
Annealed Gray Iron Castings.....	199
Small Arms Tests at Newport.....	200
Hardware	
Condition of Trade.....	201
Notes on Prices.....	203
St. Louis Shovel Company's Strike.....	204
Letters from the Trade.....	205
Mississippi and Missouri Valley Hardware Association.....	206
The Association of Shovel Manufacturers	206
Trade Items.....	206
Price-Lists, Circulars, &c.....	206
Bolgiano's New Hot Air Perfection Gas Irons. Illustrated.....	206
Expansion Shutter Hinge Eye Bolt. Illustrated.....	207
The Piqua Metallic Lath. Illustrated.	207
The Household Nail Box. Illustrated.	207
The Electric Searcher Bicycle Lamp. Illustrated.....	208
Clipper Grinders.....	208
Puck Clothes Hanger. Illustrated....	208
The Wonder Tool Holder. Illus....	209
The Darling Ice Pick. Illustrated....	209
The Peninsular Snow Shovel. Illus...	209
Herrick's Spring Hooks. Illustrated..	209
Combined Wrench and Screw Driver. Illustrated.....	210
Arade Cork Extractor. Illustrated...	210
Iver Johnson & Co.'s Revolver. Illus..	210
New Royal Pound Mill. Illustrated....	210
Current Hardware Prices	211
Current Metal Prices.....	218

HARDWARE.

Condition of Trade.

THE IMPROVED CROP REPORTS have had a good effect on the feeling of all business classes, but the uncertainty regarding tariff changes prevents any general willingness to order more than for immediate requirements. This policy has been carried by many to a point where its disadvantages more than offset its advantages. Reports from the different sections of the country indicate considerable activity, but the lines are generally small.

Chicago.

(By Telegraph.)

The crop scare is about over for this time, and jobbers are now feeling considerably better than they did a few days since, when, according to numerous press dispatches, the vegetation was completely destroyed by hot winds in a very large part of the best agricultural section of the West. Timely rains have fallen, and the outlook for crops has improved very decidedly within three days. The demand for Shelf Hardware shows considerable improvement over previous weeks. House Furnishing Goods are also moving more freely. The country merchants are still purchasing carefully, and sorting up rather than taking in stocks, but orders of this character are much more numerous. Builders' Hardware is in better demand, showing that building improvements are now being more largely made. Orders for fall goods have been placed to a considerable extent the past week for shipment in September, but this business is by no means as large as in previous seasons. Heavy Hardware jobbers report a multiplicity of small orders. They say that the complete figures for July will show a volume of business fully as good as July of last year, which is something they did not anticipate at the beginning of the month.

St. Louis.

(By Telegraph.)

The demand for Shelf Goods continues to improve and local jobbers state the situation is decidedly encouraging. Orders continue to be small in size but numerous. The demand for many goods is erratic, one day bringing large orders and the next day's mail containing nothing. Prices are not being shaded and in some cases are being slightly advanced. There is a disposition among jobbers to refrain from offering cut prices, as it has been

thoroughly demonstrated that these cut prices fail to induce buying. Shot has been slightly advanced, as the upward movement in Pig Lead has made the latter metal at least \$6 higher. The consensus of opinion is that the fall trade will be only fair and any large business will be deferred to the spring of 1895. The crop outlook has been greatly brightened by the copious rains of the past few days, and farmers are now satisfied of large crops. The corn crop of Iowa is expected to be the largest that State has ever produced. Considerable complaint is heard regarding collections, but this is the general rule during July and August.

New Orleans.

A. BALDWIN & Co.—Unusually heavy rains during the present month have somewhat retarded business in this section of the country; but even with the drawbacks, that there is an improvement is certainly very perceptible. Merchants are beginning to look over their stocks carefully and placing orders in a small way for such articles as they will need from now until the fall. A great many of these seem to have recovered from their fears as to future business and are placing stock orders. The tendency is a little more favorable for a continued improvement during the coming months.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Considering the uncertainty connected with the tariff bill and the naturally resulting depression, combined with unfavorable crop weather as reported from many sections, the trade during the past two weeks has possibly been above expectations and the month of July for Philadelphia jobbers, at least in quantity of goods shipped, if not in dollars and cents, will possibly be an exception to the preceding 12 months: business being of greater volume than for the same month of last year.

For a year past, with possibly the exception of one month, the jobbers have all had the unfortunate fact staring them in the face, that a comparison of the month's sales with those of the same time in preceding years was unfavorable—circumstances that have possibly not existed in the experience of any of the Hardware trade, and one certainly that no one hopes for a repetition of.

The greatest depression in trade at the present time seems to be in our own local market; dealers claiming no encouragement in making purchases, and the hesitancy to even replenish broken and depleted stocks seems to prevail in this section to the same extent that it has for a year and more past.

The retailers' trade on summer reasonable goods may be said to be practically over. While many have in pre-

vious seasons at this time readily placed their orders for fall and winter goods, the inclination to delay purchases covers this line as well as general Hardware. The jobber must, however, anticipate their wants that he may prepare his stock to be able to complete orders even more promptly than usual when a change in the inclination to purchase takes place, a change that we certainly hope for and feel will likely occur at a very early date.

Changes in prices have hardly been of note during the past month. During this period the Shovel manufacturers made a determined effort to effect a combination, with indications for a while of a successful termination of their labors, and pending negotiations progressed to such an extent that more than one of the leading manufacturers withdrew the low figures that they had been quoting for orders, and increased their selling price very materially. A very few, if any, of the jobbers had deemed it an opportune time to advance their selling price; consequently, now that the last meeting of the Shovel manufacturers has resulted more in an agreement to disagree than anything else, and an adjournment made without prospects of a further meeting, the jobbers are neither able nor obliged to make any changes in their selling schedule, which was already on a low basis, showing hardly a profit covering the expense of making the sale.

During depressed times, such as the country has had, it seems almost impossible to effect the completion of a combination or agreement among the manufacturers of any line of goods, as with a much more limited sale each manufacturer seems inclined to fight for trade enough to run his factory, at times without any profit, and even in many instances at a loss.

While frequently called upon to believe that this is from a philanthropic view, we feel it was more with the object of holding trade and securing new customers, that in the future the manufacturer may be in a position, when the demand does set in, to say: "We want your trade. As we protected you at such and such a time, now you should favor us."

One of the exceptions to this rule appears to be with the Chain manufacturers, whose prices appear to be well maintained.

Baltimore.

CARLIN & FULTON.—From at least one section of the South the month of July has shown probably in all lines an improvement in business as compared with the same month last year. This has been partly caused by the prospective advance on August 1 of freight rates from the extremely low figures which that section has had the benefit of for the past few weeks, and this present activity, even if but temporary, shows that trade needs the stimulus of higher prices to quicken it into life, instead of the depressing effects of declines made irrespective of cost and without reason or judgment.

While the present low prices prevail for nearly all the mineral and agricultural products of the land, it is un-

reasonable to expect their purchasing power to be curtailed by high prices for manufactured goods, but there is no doubt that there would be a mutual benefit were the market to take a general advance, no matter how slight, indicating thereby that the downward movement had been checked, that confidence in values could be felt, and that the probability of higher prices should lead buyers to replenish stocks, which have been kept at a minimum for a long time.

Were the tariff question out of the way a comparison of the situation today with that of a year ago would point to a good trade during the coming fall.

Last year the silver question had paralyzed business; the World's Fair was drawing millions of dollars out of their accustomed and proper channels and pouring them into a city miles away, from which it was hardly probable that there would be any return. We will probably never know to what extent the country had been drained during the time of its greatest financial stringency of the earnings and savings of even the poorest to visit the greatest exposition ever beheld, and the injurious effects of this upon general trade were felt more or less through the whole of last fall.

This year we will be relieved of that diversion of money and trade, and thousands of dollars will be spent with the local dealer instead of being expended in traveling and sightseeing. From different sections our salesmen write that both cotton and corn never looked better, and though prices have been and continue low, yet there is today probably as much net profit to the average planter as there has been for years past.

In spite of all the sins of both omission and commission by Congress we do not believe that the country is yet ruined, and we will yet see business revive if only the legislative branch of this country will complete its labors and adjourn.

Louisville.

W. B. BELKNAP & Co.—Business in some lines shows marked improvement this week, but it is partly based on freight advances into Southern territory announced for August 1. Heavy staple farm goods and Wagon Wood Work and Supplies, Horseshoes, Fence Wire, &c., are going out quite freely.

Trade, however, as a whole, is still unsettled and apathetic and abnormal in most characteristics, which is not to be wondered at in view of the very recent widespread destruction of property and the inert, half hearted method of dealing with it by the "second city of the country." As it is now, even some of the larger manufacturing concerns in that neighborhood, and the largest in the country of their kind, are closed down and promise to stay so, since their would-be employees cannot be sure of protection to their persons or their lives. This state of affairs nullifies values, makes capital timid and puts an effectual stop to all new enterprises.

The only Southern State which has been seriously disturbed during this whole trouble is Alabama, and that within the limited mining region. In strong contrast to the performances of State authorities north and west of us, Governor Jones has taken the matter well in hand himself, put in a prompt appearance in person in the thick of it at Birmingham, and proposes that the criminals and not the good citizens of his Commonwealth shall suffer. He proposes

to enforce the penalties prescribed for arson, assault and murder.

The only Southern State which has brought any discredit upon itself through official utterance is Texas, which from the nature of its population is somewhat more nearly allied to the West than the South, and we are very loath to believe that the fears and dire prophecies of Governor Hogg reflect at all the sentiments of his people. There is too much genuine Democracy within the border of the Lone Star State, which believes in local self-government, in each community caring for its own and preserving order, to fear any general disruption by reason of misled Socialists or Anarchists, for they are all different degrees in result of the same social and economic heresies. The majority is keeping quiet, but we opine is doing a deal of thinking in these times before the elections.

Boston.

BIGELOW & DOWSE COMPANY.—During the vacation season and the intense heat there is little disposition or profit in urging sales. Still the men on the road are sending in their usual orders and the volume of business, which is usually light at this season, will be well up to last year. There are but few changes and those that have been made are a reduction from former prices. Screws, Butts and Wire Nails are weaker, while Shot has advanced 5 cents per bag. Prices of goods are now well down to the basis of the proposed new tariff and the only effect of its passage would be to stimulate trade, and it is thought that buying will be freer and the goods in manufacturers' hands will soon be taken up, which, in itself, will have a tendency to increase the values of goods. By many it is thought the Cutlery tariff as passed by the Senate will not be changed. If this becomes a law it will only reduce the cost of imported Pocket Cutlery from 10 to 15 per cent. While this schedule is not satisfactory to importers it cannot injure the American manufacturer and where parties are needing Cutlery for fall trade they will find no difficulty in placing orders based on the new tariff. There is a large amount of Cutlery now in bond and much that is held ready to ship as soon as the tariff is decided. It seems too bad that Congress does not take better care of the business interests of the country. It is a fact that when politics and politicians get too bad and too overbearing in cities, and the business community rise in their might, they clear the atmosphere and we have better government for a while. Is it not time for the business interest of the country to assert its power and send business men to represent them in national Legislature?

Labor has organizations, why should not the business interests of the country have their national organization and send men to represent them who will care for their interests and will show a proper respect to the delegations of the Board of Trade that may be sent to Washington to explain the needs of the business community?

San Francisco.

MILLER, SLOSS & SCOTT.—Since our last report the railroad strike has occurred and affected all lines of trade very materially, more particularly our fruit trade. The strike occurred in the busiest time of the season, and fruit that was ready for marketing in the East could not be shipped and consequently spoiled on the hands of the shippers.

The merchants of San Francisco were unable to receive or forward

goods, and business was at a stand still during the strike. Trains, however, are now moving and a better feeling is prevailing among the business community.

Our Midwinter Fair has closed and will show a surplus, which will probably be devoted to beautifying the Golden Gate Park.

The outlook for trade this fall is fair and collections will not improve until after harvest.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—Now that the mails are running regularly, we are in receipt of detained numbers of *The Iron Age*, and note many matters of interest, including some items respecting the late flood. Our curiosity has been somewhat excited by the appearance of two recent letters giving some particulars, and, while they are substantially true, we are at loss to imagine from what source they reached you.

We did not consider it worth while to enlarge very much upon the damage accruing from the flood, believing, from past experience, that it would prove to be much less than at the time seemed probable. The result has justified our prediction.

C. H. Dodd & Co. and ourselves moved desks and office appointments to temporary offices up town, while we believe Honeyman, DeHart & Co. remained at their old quarters during the whole flood. The Oregon Railway & Navigation Company's road was badly injured by the high water, running, as it did, for nearly 100 miles on the south side of the Columbia River, and being in many places wholly submerged. This, of course, was a great obstacle to the shipment of goods, but many of the points along the rivers were reached by a number of small steamboats, which have done a lively business. Of course, business was done under difficulties; but by the use of skiffs, taking the place of carts and express wagons, we kept up our orders, excepting from places inaccessible. Now that the water has fallen, cellars and sidewalks are dry and stocks in place, excepting that here and there painters are at work obliterating flood stains, it would be difficult to persuade a new comer that the water had, within a few weeks past, reached the height it actually did.

As a matter of fact, the railroad tie up was quite as serious and detrimental to trade as the flood itself. That did occasion a piling up of orders and a serious inconvenience to both jobber and customer. They are now pretty well disposed of, Eastern freight trains are beginning to run and matters are wearing their usual aspect.

Trade has been good the past month and all accounts of crops from the interior are very encouraging.

The strike of railroad employees, so far as Portland was concerned, had no significance, excepting as an incident of the general condition throughout the country. When it weakened at Chicago it quickly subsided here.

Omaha.

LEE-CLARKE-ANDRESEN HARDWARE COMPANY.—In a general way the interim since our last review has not witnessed much change in the local jobbing Hardware trade.

The quieting down of the labor troubles on the different lines of railway and the resumption of traffic in most sections of the country have naturally produced a beneficial effect.

Public apprehension of more serious

troubles to come has died out, and the country generally is in much better shape to do business.

The dry weather of the past few weeks has been a disturbing element. Farmers and business men feel very uneasy over the present conditions, and unless we are favored with copious showers within the next few days corn will be seriously damaged in many sections of the State. A sufficient degree of moisture between this time and the middle of August will assure an abundant crop, establish the confidence of the retailers on a firm basis, and the era of increased trade and more liberal orders will be ushered in from that time.

Our next report will probably tell the story.

Notes on Prices.

Wire Nails.—We have to note considerable inquiry for Wire Nails, with light and decreasing stocks, as almost all the mills remain closed. There is no change in prices. Quotations continue on the basis of \$1.15 for carload lots at mill, a figure which is, however, sometimes shaded, but none of the manufacturers are willing to quote lower than \$1.10. The New York price for small lots from store is \$1.30 to \$1.35.

Chicago, by Telegraph.—Manufacturers' agents report largely increased inquiries, but buyers are making a strong fight for lower prices. Factory quotations are \$1.17½ to \$1.20, Chicago, but counter offers have been made by buyers which are in some cases considerably lower. The manufacturers are in such position that if they do not throw away their advantages they will be able to control prices and compel buyers to come to their terms. Few factories are running and stocks are small. The demand from the country trade and from consumers is light, so that large buyers are in no haste to place contracts, and therefore the game of waiting may be prolonged for some time to test the strength of manufacturers. Small lots from store are selling at \$1.20.

Cut Nails.—Business in Cut Nails has been light, with no alteration in prices and no change in the general situation. The Eastern market is represented by the quotation of 95 cents to \$1 for carload lots on dock. The store price for Cut Nails in New York is \$1.10 to \$1.15.

Chicago, by Telegraph.—The Lake Side Mill has at last been started up, after having been shut down for two months. It is now running single turn on contracts which have accumulated and a steady run is expected from this time forward. New business is not large but orders are coming in reasonably well. The trade now in progress appears to be entirely in the hands of local manufacturers. Factory lots are quoted at 95 cents, Chicago, on 60-cent average. Small lots from stock are unchanged at \$1.15.

Barb Wire.—There is extremely little doing in this article, as is natural at

this season, and the situation remains unchanged, without either pressure to sell or eagerness to buy. The market is represented as at our last report by the following prices for Four-Point Galvanized, delivered at the points named: Pittsburgh, \$2.05 to \$2.10; Cleveland, \$2.10 to \$2.15; Cincinnati or Allentown, \$2.25 to \$2.30; Chicago or New York, \$2.25 to \$2.30.

Chicago, by Telegraph.—Manufacturers and jobbers are doing very little in Barb Wire at present. No effort is being made to rush sales. Quotations on Galvanized from stock are continued at \$2.35 to \$2.40, with 10 cents less for carloads.

Berry Clothes Sprinkler.—A description of this Sprinkler was given in our last issue. It is put on the market by the Berry Sprinkler Company, 146 Franklin street, Boston, and is sold to the trade at 25 cents net.

Fayette R. Plumb.—Fayette R. Plumb, Philadelphia, issues a new discount sheet under date of July 27, in which a number of reductions from his previous prices are announced.

Shot.—Owing to a shortness in the supply Pig Lead has advanced, and consequently manufacturers of Shot have issued the following prices to take effect July 27, terms net cash 30 days, or 2 per cent. for cash remitted within 10 days of invoice:

	Per bag.
Drop Shot, sizes smaller than B, 25-pound bag	\$1.15
Drop Shot, sizes smaller than B, 5-pound bag	.30
Drop Shot, B and larger sizes, 25-pound bag	1.40
Drop Shot, B and larger sizes, 5 pound bag	.35
Buck and Chilled Shot, 25-pound bag	1.40
" " " 5-pound "	.35
Dust Shot, 25-pound bag	1.75
" " " 5-pound "	.40

In lots of 2000 pounds and upward, taken at one time, a discount of 20 cents per 100 pounds and 2½ per cent. will be allowed.

Cimtar Steak Knife.—Nichols Bros., Greenfield, Mass., are putting on the market a marketman's Steak Knife which they call the Cimtar, the shape of which was originated several years ago for one of the leading large retail markets of Springfield. For a time they were made only for the trade as required, but the demand has grown so of late that they have been compelled to keep them in stock, and we are advised that the goods are now carried by the leading dealers in New England. The Knife, which is illustrated in their advertisement on another page, is sold from the following list, which is subject to a discount of 50 per cent. to the trade:

10-inch.....	\$9.60
12-inch.....	15.00
14-inch.....	21.00

Combination Countersink and Nail Set.—This article was described in *The Iron Age* of July 12. It is put on the market by the Irwin Auger Bit Company, Wilmington, Ohio, by whom it

is sold to the trade at \$2 per dozen, subject to a discount of 50 per cent.

Screws.—The Screw manufacturers held a meeting on July 27 and adopted new prices for Screws and goods related to that line by revising discounts and making a new list on Machine Screws, both Brass and Iron. This list will be found on the next page. The following are the discounts on Screws as issued by the American Screw Company:

Patent Gimlet Pointed Wood Screws.

Discount.

Iron, Bright, Flat Head.....	85
" " Round Head.....	75
" Blued, Flat Head, add 5 per cent. to net amount of invoice.....	85
" Blued, Round Head.....	75
" Felloe, Flat Head.....	60
" Pinched Head.....	75
" Japanned, Flat Head.....	75
" Round Head.....	70
" Tinned, Flat Head.....	65
" Round Head.....	60
" Lacquered, Flat Head.....	65
" Round Head.....	60
" Bronzed, Flat Head.....	65
" Round Head.....	60
" Brass Plated, Flat Head.....	65
" Round Head.....	60
" Copper Plated, Flat Head.....	65
" Round Head.....	60
" Nickel Plated, Flat Head, Burnished.....	75
" Nickel Plated, Round Head, Burnished.....	72½
" Silver Plated, Flat Head, Burnished.....	50
" Round Head, Burnished.....	50
Brass, Flat Head.....	85
" Round Head.....	75
" Lacquered, Flat Head.....	65
" Round Head.....	60
" Bronzed, Flat Head.....	65
" Round Head.....	60
" Silver Plated, Flat Head, Burnished.....	50
" Silver Plated, Round Head, Burnished.....	50
" Nickel Plated, Flat Head, Burnished.....	66⅔ and 6
" Nickel Plated, Round Head, Burnished.....	66⅔
Copper, Flat Head.....	65
" Round Head.....	60
Bronze, Flat Head.....	80
" Round Head.....	75
Phosphor Bronze, Flat Head.....	60
" Round Head.....	55
Roger's Drive Screws.....	87½

Machine Screws, Bolts, Rivets and Miscellaneous Goods.

Discount.

Machine Screws, Iron, Flat Head.....	45
Iron, Round Head.....	40
" Fillister Head.....	35
Brass, Flat Head.....	45
" Round Head.....	40
" Fillister Head.....	35
Taps, for Machine Screws.....	65
Tire Bolts, Norway Philadelphia.....	80
Eagle Philadelphia.....	85
Bay State.....	75
Sleigh Shoe Bolts.....	85
Stove Bolts, Flat Head.....	70
Flat Head, Annealed.....	70
Round Head.....	70
Stove Rods.....	70
Sink Bolts.....	70
Pointed Wires.....	65
Tapped Nuts.....	50
Norway Rivets—Ordinary, in bulk.....	65 and 10
Coopers, in bulk.....	65 and 10
Thousand, in bulk.....	65 and 10
Thousand, in papers.....	65 and 10
Block and Carriage, in papers of 100,.....	65 and 10
Hame.....	65 and 10
Belt, with Burrs.....	65 and 10
Bay State Rivets, ¾ cent net per pound less than Norway Rivets.....	65 and 10
Burrs, for Rivets.....	65 and 10
Coach Screws.....	85
Hand Rail Screws.....	80
Miscellaneous Wire Nails, Steel, 1, 5 and 10 pound packages.....	85
25 and 50 pound packages and 100-pound kegs.....	85
Glass.—The condition of the Glass market as reported in our last issue re-	

mains practically unchanged. The demand for Glass is light and little is being done to stimulate business. While 80 and 20 per cent. discount is the quoted price on American Glass, at factory in car lots, it is understood that obtainable prices are represented by discounts of from 85 to 85 and 5 per cent. Imported Window Glass is quoted at 80 and 10 per cent. discount in any quantity. Plate Glass is sold at from 70 to 70 and 10 per cent. discount from Eastern list, according to size.

St. Louis Shovel Company's Strike.

REPORT has been current that the employees of the St. Louis Shovel Company, St. Louis, Mo., are on

road strikes notice was given the men that the works would shut down on June 30 for an indefinite period. This notice also recited the fact that as the product of the works would have to be reduced to insure steady work, only one half the former force would be needed. At this juncture the officers of the labor union called on the officers of the St. Louis Shovel Company, presenting a paper for their signature, with the verbal statement that the points indicated in the paper would be the only basis for settlement. A few of the main points are given as a sample of the arbitrary position taken by the workmen. 1. The St. Louis Shovel Company must at all times give employment to members of good standing of labor union only. 2. No person must be employed to do piece work until such person had been employed at day work by the company for a period of not less than six months. 3. Laborers must be furnished to clean up all departments and deliver material

work would be received, without discrimination as to whether the applicants were or were not union men. The officers of the labor union demanded that none but non-union men must be employed, and also that all the men who were members of the union must be employed. The fact that there might be more of the latter than the company would need did not seem to enter into consideration at all. The company suggested that they would take back such men as they could work. To this the union said no, all must be given work or none. The question of wages was not an element in the case, and was not discussed except in an informal manner, and was not made an issue in the case. It is the opinion of the St. Louis Shovel Company that the whole cause of the trouble has been the organization of the labor union in their works and that the failure of the profit sharing plan is directly attributable to this fact. The system of profit sharing contemplated

MACHINE SCREWS—Flat, Round and Fillister Head.

List of August 1, 1894.

Price per gross.

$\frac{3}{16}$ -Inch.	$\frac{1}{4}$ -Inch.	$\frac{5}{16}$ -Inch.	$\frac{3}{8}$ -Inch.	$\frac{7}{16}$ -Inch.	$\frac{1}{2}$ -Inch.	$\frac{9}{16}$ -Inch.
No. Iron. Brass.	No. Iron. Brass.	No. Iron. Brass.	No. Iron. Brass.	No. Iron. Brass.	No. Iron. Brass.	No. Iron. Brass.
2....\$0.23...\$0.29	2....\$0.23...\$0.29	2....\$0.23...\$0.29	2....\$0.23...\$0.29	2....\$0.23...\$0.29	2....\$0.23...\$0.29	2....\$0.23...\$0.29
3....23....29	3....23....29	3....23....29	3....23....29	3....23....29	3....23....29	3....23....32
4....23....29	4....23....29	4....23....29	4....23....29	4....23....29	4....23....29	4....24....35
5....24....31	5....24....31	5....24....31	5....24....31	5....24....31	5....24....31	5....25....37
6....24....33	6....24....33	6....24....33	6....24....33	6....24....33	6....24....33	6....24....40
7....25....38	7....25....38	7....25....38	7....25....38	7....25....38	7....25....40	7....25....45
8....27....45	8....27....45	8....27....45	8....27....45	8....27....45	8....27....47	8....27....50
9....29....52	9....29....52	9....29....52	9....29....52	9....29....52	9....29....55	9....29....57
10....32....60	10....32....60	10....32....60	10....32....60	10....32....60	10....32....65	10....32....65
12....36....75	12....36....75	12....36....75	12....36....75	12....36....75	12....36....80	12....36....85
14....45....1.00	14....45....1.00	14....45....1.00	14....45....1.00	14....45....1.00	14....45....1.05	14....45....1.10
16....55....1.25	16....55....1.25	16....55....1.25	16....55....1.25	16....55....1.25	16....55....1.30	16....55....1.35
18....60....1.50	18....60....1.50	18....60....1.50	18....60....1.50	18....60....1.50	18....60....1.55	18....60....1.60
20....65....2.10	20....65....2.10	20....65....2.10	20....65....2.10	20....65....2.10	20....65....2.15	20....65....2.20
22....70....2.60	22....70....2.60	22....70....2.60	22....70....2.60	22....70....2.60	22....70....2.70	22....70....2.70
24....75....3.15	24....75....3.15	24....75....3.15	24....75....3.15	24....75....3.15	24....75....3.25	24....75....3.25
56-Inch.	$\frac{3}{4}$ -Inch.	$\frac{7}{16}$ -Inch.	1-Inch.	1 $\frac{1}{2}$ -Inch.	1 $\frac{1}{4}$ -Inch.	1 $\frac{3}{4}$ -Inch.
No. Iron. Brass.	No. Iron. Brass.	No. Iron. Brass.	No. Iron. Brass.	No. Iron. Brass.	No. Iron. Brass.	No. Iron. Brass.
3....\$0.25...\$0.35	4....\$0.30...\$0.50	5....\$0.35...\$0.62	6....\$0.41...\$0.75	7....\$0.47...\$0.95	8....\$0.55...\$1.10	9....\$0.62...\$1.40
4....26....40	5....32....52	6....34....55	7....43....65	8....50....70	9....57....75	10....65....1.50
5....27....42	6....34....55	7....34....55	8....46....60	9....53....60	10....60....64	12....73....1.75
6....29....45	7....36....60	8....42....65	9....48....75	10....56....80	12....68....1.60	14....82....2.05
7....31....50	8....38....65	9....44....85	10....51....90	11....60....95	14....76....1.90	16....80....2.40
8....34....55	9....40....75	10....47....85	12....58....95	13....70....100	15....85....2.25	18....90....2.95
9....36....65	10....42....85	12....53....95	14....65....100	16....79....105	18....95....2.75	20....100....3.90
10....38....75	12....48....1.05	14....59....1.45	16....73....1.95	18....89....2.55	20....105....3.65	22....130....4.55
12....43....95	14....53....1.30	16....65....1.65	18....75....2.20	20....91....2.35	22....120....4.25	24....145....5.65
14....43....1.20	16....60....1.65	18....75....1.65	20....91....2.20	22....10....1.10	24....135....5.30	26....165....6.40
16....60....1.50	18....67....2.05	20....85....2.45	22....10....3.75	24....12....5.00	26....150....6.00	28....185....7.85
18....65....1.90	20....80....2.75	22....95....3.50	24....11....4.75	26....14....5.05	28....170....7.15	30....205....8.95
20....75....2.50	22....90....3.25	24....10....4.00	26....13....5.25	28....15....6.75	30....190....8.30	
22....85....3.00	24....95....3.75	26....12....4.75	28....14....6.35	30....17....7.75		
24....90....3.50	26....10....4.50	28....12....5.85	30....16....7.25			
1 $\frac{1}{2}$ -Inch.	1 $\frac{3}{4}$ -Inch.	2-Inch.	2 $\frac{1}{4}$ -Inch.	2 $\frac{1}{2}$ -Inch.	2 $\frac{3}{4}$ -Inch.	3-Inch.
No. Iron. Brass.	No. Iron. Brass.	No. Iron. Brass.	No. Iron. Brass.	No. Iron. Brass.	No. Iron. Brass.	No. Iron. Brass.
10....\$0.70...\$1.65	12....\$0.95...\$2.25	14....\$1.25...\$3.00	16....\$1.70...\$4.00	18....\$2.25...\$5.75	20....\$3.00...\$7.70	22....\$4.00...\$10.20
12....80....1.90	14....1.10....2.55	16....1.40....3.50	18....1.90....4.95	20....2.55....6.65	22....3.40....8.90	24....4.50....12.00
14....90....2.20	16....1.20....3.00	18....1.60....4.30	20....2.15....5.75	22....2.85....7.75	24....3.80....10.50	26....5.05....14.50
16....1.00....2.60	18....1.35....3.70	20....1.80....5.00	22....2.40....6.75	24....3.20....9.20	26....4.25....12.70	28....5.70....17.60
18....1.15....3.20	20....1.50....4.65	22....2.00....5.90	24....2.70....8.00	26....3.60....11.10	28....4.80....15.40	30....6.35....21.20
20....1.25....4.15	22....1.70....5.45	24....2.25....7.00	26....3.05....9.70	28....4.05....13.40	30....5.85....18.60	
22....1.45....4.85	24....1.90....6.85	26....2.55....8.50	28....3.40....11.70	3....4.50....16.20		
24....1.60....6.05	26....2.15....7.75	28....2.85....10.30	30....3.80....14.20			
26....1.80....6.85	28....2.40....9.00	30....3.20....12.40				
28....2.00....8.15	30....2.70....10.80					
30....2.25	9 50					

a strike, and the fact that these works have been operating on the profit sharing plan for some time has caused more or less comment. The facts in the case are as follows: During the past seven years the profit sharing arrangement has been in force and dividends have been paid regularly each year with but one exception. During the panic of 1893, when orders were being countermanded right and left and prices being cut in like proportion, the company reduced the wages of their employees 15 per cent., which was accepted by the men, as it was agreed by the company that every effort would be made to keep the works running full until July 1, 1894. The works were run steadily until that time, but on account of the general depression in trade and prevailing rail-

to the bench of the workmen. These points were only three of ten, the others being of a similar nature. It was also verbally stated by the committee that any difference which might arise between employer and employees should be reported to a committee of the employees, which they themselves should appoint, and if they could not settle the matter it was then to be referred to a committee of arbitration consisting of two members chosen each by the employer and employees, these four to select a fifth if they could not agree. They also stated that no man must be discharged without their consent, and none employed without their approval. These latter conditions even applied to foremen and superintendents. As the works were ready to start again shortly after July 20 the officers of the St. Louis Shovel Company stated that applications for

confidential relations between employer and employees, with a sufficient degree of intelligence on the part of the latter to understand that while they may share in years of prosperity, they should not expect equal results in a year of adversity. On July 23 the works were started up and considerable trouble was experienced by the intimidation of those working by those who were not engaged when the works were ready to start. On the 24th an injunction was applied for and granted—which will stand until a motion to dissolve is made and sustained—against eight of the former employees of the company, who are regarded as ringleaders. The injunction is of the same nature as that issued by the Federal courts during the recent strike of the A. R. U. in Chicago and elsewhere and it is, we are informed, the second instance in which a manufacturing con-

cern took this action. Since the issuing of the injunction all is quiet at the works and everything moving along very harmoniously. The St. Louis

Shovel Company took the proper course at the beginning of the trouble and are to be congratulated upon the successful issue of the matter.

Letters from the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

Repair Shops in Connection with Hardware Stores.

The inquiry of a correspondent as to the feasibility of carrying on a general repair shop in connection with a Hardware store, which appeared in our issue of July 26, 1894, has called out a number of interesting replies from Hardware dealers in various parts of the country. These communications express, almost without an exception, the belief that repair shops are a necessary adjunct to Hardware stores, especially if a good mechanic is employed and the shop properly conducted. In some cases it is found that many goods are sold through the influence of the shop. Many stores having tin shops connected with them have added an assortment of small tools for repairing bicycles. There are doubts expressed by some of our correspondents as to the feasibility of successfully carrying on a repair shop in a space 5 x 10 feet in connection with a Hardware store. The extracts from letters which we herewith present no doubt contain ideas and suggestions which, with modifications necessary in individual cases, can be successfully adopted by those who are desirous of adding repair shops to their business.

A Nebraska firm, after stating that they do a large number of small jobs that always come to Hardware stores, and find it very profitable, relate as follows the cause of their starting a repair shop :

Some five years ago we discarded the little tool box and vise from under the counter, and now wonder why we did not do it ten years ago. Our reason for doing this was that quite often a customer would want some small job done, and if a salesman stopped to do it for him the customer would not think his time of any value, and, of course, would not expect to pay for it; while, on the other hand, if the salesman took the job to the shop and had a mechanic do the work the customer would invariably expect to pay for it.

An Alabama concern are of the opinion that lasting customers are made by offering them facilities for making their own repairs, and describe their conveniences and system as follows :

We do not run a regular shop, or rather do not take in jobs and charge for them. We have a work bench about 15 feet long across the front end of our cellar where we get a good light and keep within reach any tools that we might need in fitting stove pipe, putting handles in axes, sharpening tools, fitting keys, &c., and we find it a great convenience, in fact would not be without it. We allow

our customers the use of tools, &c., whenever they require them, and while we never make a charge for any work done we believe it pays us well; for in most cases an accommodation of that kind makes a lasting customer. We are, of course, sometimes imposed upon, but as we stated above we could not well get along without our work bench and tools, and think any Hardware house would find it a great convenience.

A New York city Hardware merchant has had a repair shop in connection with his business for a number of years, and the following description of it will prove of interest :

I have for the past 20 years had a repair shop in connection with my store, and have found it not only a great convenience, but also a profitable investment. The shop proper occupies a space of 15 x 20 feet in the rear of an L to the main store, is furnished with light and ventilation by a skylight 5 x 10 feet. The outfit consists of a good fast lathe, lever punch, an iron or wire cutter, grindstone, emery wheel and polisher, anvil, vises, &c., and necessarily a full complement of small hand tools. I had for many years also a portable forge, but abandoned it owing to the smoke and smell. The class of work done is of an infinite variety—key fitting, lock repairing, bell hanging, the grinding of knives and scissors, being always a source of considerable revenue. It is almost impossible, however, to calculate the value of such an adjunct in the daily demands of your customers for an extra key to a lock, shortening of a spindle, or the making of a few special bolts or striking plates, which must be had in a hurry, being a great convenience to your customers and resulting in a profit for yourself.

A prominent Hardware concern in a large Iowa town refer to their repair shop and tools, also to the profit derived from this department of their business, in the following interesting manner :

Two years ago last January we started the repair shop in connection with our business. We have a room about 12 x 16, fitted up with lathes, forge, anvil, &c., suitable for all kinds of light work, such as bicycle, gun and lock repairing. We do not claim that it has made for us any great amount of money directly, but do think that indirectly it is a great advantage to our business. In connection with this we do a large amount of repairing on gasoline stoves. We have kept track of same—that is, the amount of money received from this repairing, and in figuring same up we find that there is not much profit in it after paying the salary of the workman and figuring the interest on the amount invested. Our original purchase of tools was a little over \$200 and we have added more or less since; a close estimate on same would be about \$300. We have noticed that it is often the case that we sell parties goods through the influence of this shop, and have no

doubt whatever but what it is a paying investment. The letter in question is one of considerable importance to the Hardware trade, yet his idea regarding a repair shop is too small. If one attempts to repair sundries in our line he must be in a position to do the work that is presented—that is, light repairing, such as bicycles, gasoline stoves, guns, locks, &c. A good lathe, anvil, forge and smaller tools necessary will be plenty for the work required. We have never attempted to repair any lawn mowers, as they are practically too large to handle, but as bicycles are a prominent feature with our business we have made this a specialty.

A large Illinois Hardware concern who employ seven workmen in their shop, where metal and pump work is carried on, also have necessary tools and repairs for bicycle work, of which the following list is given :

We have block and tackle for holding bicycle in place while repairing, repair outfits for all the principal makes of pneumatic tires, small bicycle wrenches, spoke grips, clamps for repairing wooden rims, glue, cement, rubber cement, linen thread, enamel, sheet rubber, tire heater, oilers, oil rags, polish cork handles, &c. We repair a good many wheels and find it very profitable. The outfit to repair them is cheap and the profit is large. We would not know how to make a success of the Hardware business in this city without our tin shop and repair shop, as it brings us in a good many dollars, and one of the clerks does all the bicycle repairing at odd times, thus saving the time of the men in the shop.

Where there are regular bicycle repair shops or machine shops in the town carried on by responsible parties, merchants in some instances find it convenient to turn repair work over to them. This course is pursued with good results by a merchant in New York State, and is referred to by him as follows :

We have three regular bicycle repair shops in connection with gun repairing and other light work in different parts of the city. In our own establishment we have one man who attends to the retail sales of bicycles who also looks after the repairs on those which we have sold, as it seems natural for the purchaser in case of accident or breakage to come to the party from whom he made the purchase in order to obtain the necessary repairs. Our man has acquired some experience in light repairing, such as mending punctures in tires, trueing up wheels, &c. Any work requiring brazing or any other phase of the more difficult mechanical work we have done at one of the regular repair shops. We have near us a party who is engaged in the work of stencil making, rubber stamps, key fitting, umbrella mending and similar work. When we have anything in light repairing of this kind we send it to him to be done. It has often occurred to us that if we had room for this purpose it would be a source of revenue to us to engage a man to do work of this class, and in a city of this size we believe it would be not only feasible but profitable to have such work shops connected with the Hardware stores, as this class of work naturally comes to the Hardware dealer, connected as it is with the regular Hardware lines.

CAPT. FRED BARKER, of Barker, Rose & Gray, Elmira, N. Y., arrived in the city early in the week.

Mississippi and Missouri Valley Hardware Association.

THE MISSISSIPPI AND MISSOURI VALLEY HARDWARE ASSOCIATION will hold their annual meeting at Lake Minnetonka, Minn., on August 7 and not August 14, as previously announced.

The Association of Shovel Manufacturers

AN ADJOURNED MEETING of Shovel manufacturers of the United States was held at Niagara Falls, N. Y., on July 24 and 25. The following concerns were represented: Oliver Ames Sons Incorporated, North Easton, Mass.; Hussey, Binns & Co., Limited, Pittsburgh; Hubbard & Co., Pittsburgh; J. C. Russell Shovel Company, Pittsburgh; H. M. Myers Company, Beaver Falls, Pa.; Terre Haute Shovel & Tool Company, Terre Haute, Ind.; Wright Shovel Company, Anderson, Ind.; St. Louis Shovel Company, St. Louis, Mo.; M. Rowland & Co., Philadelphia, Pa.; Pfeiffer & Co., Philadelphia, Pa.; Geo. Griffith, Philadelphia, Pa.; Ross & Co., Ilion, N. Y.; Wyoming Shovel Company, Wyoming, Pa. Excursions to various points of interest were given and the social features of the meeting were thoroughly enjoyed by all who were present. An election of officers was held, resulting in the selection of J. C. Birge of St. Louis Shovel Company as president and H. P. Sullivan, Erie, Pa., as secretary. No fixed time was set for the next meeting, but it will probably be held at an early date.

Trade Items.

THE SHELBY STEEL TUBE COMPANY, Shelby, Ohio, have issued a view of their plant, finished in colors. The picture is 17 x 40 inches in size, and shows works, office and the other necessary buildings connected with the manufacture of Steel Tubes.

HOWARD & MORSE, 45 Fulton street, New York, manufacturers of Wire Goods, sustained some injury to their factory in Brooklyn in consequence of a fire on adjoining property on the night of July 24. Their stable was destroyed and an extention to building No. 10 of their plant was damaged. Loss, \$4000 to \$5000. The fire, we are advised, will not in any way interfere with the execution of any orders in hand.

THE ATLAS TACK CORPORATION, Boston, Mass., have changed the location of their Philadelphia branch house to 339 Market street, and their Chicago house from 239 to 193 Lake street.

CORDELY & HAYES, 172 Duane street, New York, have brought out a new line of Indurated Fiber Ware, which, we are told, owing to new processes, they are enabled to produce more economically. The assortment includes Wash Basins, Spittoon Tops, Pail Covers, Slop Jar, Mats, &c. The advantages obtained in the improved patterns are a more shapely appearance, the Wash Basins approaching those enameled on metal, with regard to thickness of material. The goods have a cherry porcelain finish and are said to retain the good qualities of

their "Fibrotta" or Lily Brand Fiber Ware.

ROSS C. KING, representing the New York Belting & Packing Company, 15 Park row, New York, is sending a rather unique card of advance notice to his trade. The card calls attention to the company's Vulcanite Emery Wheel, which is referred to as fast and safe.

S. S. BRYAN, Titusville, Pa., president of the National Retail Hardware Dealers' Association, was in this city last week and visited the Hardware Club, with the arrangement of which he expressed himself as much pleased.

AT A MEETING of the directors of the Gilbert & Bennett Mfg. Company, held at the office of the company in Georgetown, Conn., on July 24, resolutions of regret were adopted relative to the recent death of Elbert B. Monroe, a member of the board.

A NEW VOCATION appears to have made its appearance in the crowded streets and alleys of the manufacturing districts of Philadelphia—namely, the vending of "snow balls." In its issue of July 27 the Philadelphia *Evening Telegraph* devotes a column to a vivid description of the eagerness and excitement engendered among the parched and thirsty inhabitants by the appearance in those quarters of the "snow ball" man with his barrow. These "snow balls" are nothing more nor less than lumps of shredded ice, scraped to order off the block, flavored with the usual flavors, and sold for the sum of 1 cent. The responsibility for the introduction of these popular dainties appears to rest chiefly with the Enterprise Mfg. Company of Philadelphia, who have put on the market an article for the purpose of manufacturing "snow balls," called the Enterprise Ice Shredder, to which particular attention is called in the advertisement of the concern on another page. In a circular relating to the Shredder the company call attention to its efficiency, simplicity and small cost. It is made tinned or nickel plated, the latter kind being specially adapted for bars, clubs, yachts, &c.

Price-Lists, Circulars, &c.

IDEAL MFG. COMPANY, Detroit, Mich.: Ideal Toys. An illustrated catalogue and price-list contains representations of a line of Iron Toys, including Ranges, Stoves, Cars, Locomotives, Fire Engines, Hook and Lad-

calls attention to new goods now illustrated for the first time. The goods shown with list prices include a large and varied line of Cork Screws, Ceiling Hooks, Coat and Hat Hooks, Side-wall Hooks, Bird Cage or Hanging Basket Hooks, Cornice Hooks for picture hanging, Card Holders, Picture Nails, Toasting Forks, &c.

PATTERSON, GOTTFRIED & HUNTER, 146-150 Centre street, New York: Machinery, Metals, Hardware, Tools and Supplies. The company call the attention of the trade to the fact that they are prepared to furnish Jessop's Steel at Jessop's prices, cut to length.

Bolgiano's New Hot Air Perfection Gas Irons.

The accompanying cuts represent hot air gas irons offered by the Bolgiano Mfg. Company, 415 Water street, Baltimore, Md. The iron for household or laundry use shown in Fig. 1 is nickel plated and weighs about 7½ pounds. A bronze tube and mixer en-

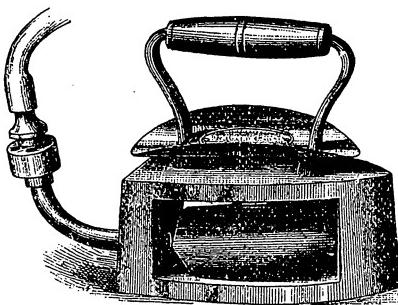


Fig. 1.—Household or Laundry Iron.

ters the back of the iron, and to this is attached a rubber tubing, the other end being placed on the gas burner. A wire bracket and spiral spring are provided to hold the upper portion of the rubber tube in a convenient position. The iron consumes but a small quantity of gas, the cost being 5 cents per day for gas, as stated by the manufacturers. The points of excellence claimed for the iron by the makers are as follows: It is always hot, saves coal and does away with the overheated stove; it allows the room to be kept at a pleasant

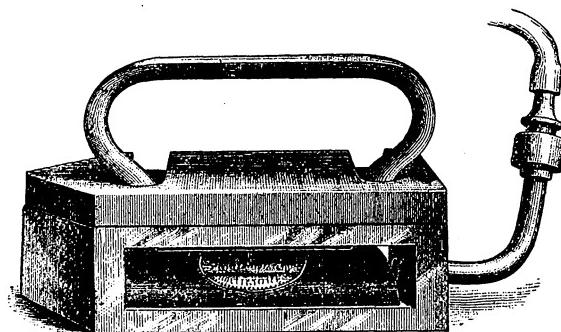


Fig. 2.—Tailor Iron.

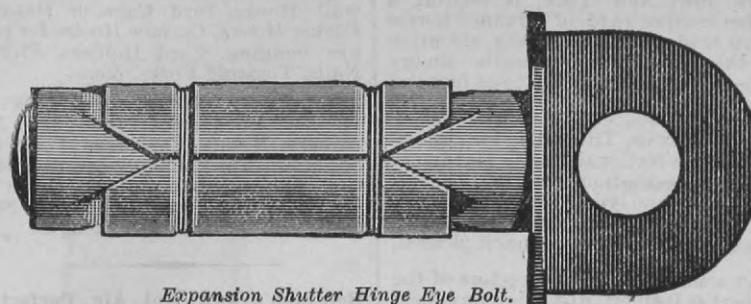
der, Hose Cart and Carriage, Police Patrol, &c. The manufacturers remark that owing to the success achieved with their Toy Stoves they have felt encouraged to place on the market, in addition, the line of Toy Ranges and Iron Wheel Toys.

C. T. WILLIAMSON WIRE NOVELTY COMPANY, Newark, N. J.: Wire Novelties. Their 1894 catalogue of 60 pages

temperature, both in summer and winter; it saves steps from the ironing board to the stove, and can be operated sitting as well as standing. The tailors' iron, illustrated in Fig. 2, is operated in the same manner as the smaller iron. The makers state that it gets hot in five minutes; that there is no smell or dirt in using it, and that it is economical, costing but a few cents a day for gas.

Expansion Shutter Hinge Eye Bolt.

The illustration herewith shown is of an expansion shutter hinge eye bolt



Expansion Shutter Hinge Eye Bolt.

which the Steward & Romaine Mfg. Company, 123 North Sixth street, Philadelphia, are introducing. By the use of this eye bolt the drilling through a wall incident to the use of a common bolt is obviated, and the inside finish of a wall therefore undisturbed. A hole not larger at the bottom than at the top, and of sufficient size and depth to allow the insertion of the expansion parts, is cut in the wall ; the eye is then placed in position and turned, causing the expansion parts to spread and bind themselves in the hole and become immovable, except by the unscrewing of the bolt. The company recommend the bolt for use by manufacturers and others who wish to equip their buildings with fire proof shutters in order to avail themselves of the rebate in the rates of insurance offered by the Board of Fire Underwriters on buildings so equipped.

The Piqua Metallic Lath.

The Cincinnati Corrugating Company, Piqua, Ohio, are now placing on the market the improved form of steel lath shown in the accompanying cut. The material used, it is stated, is the best grade of steel, in sheets $2\frac{1}{2}$ inches wide by 48 inches long, each sheet covering one square yard of surface. The sheets are traversed lengthwise at intervals of $3\frac{1}{2}$ inches by $\frac{1}{4}$ inch corrugations, to provide great rigidity and stiffness to the entire sheet. Between the corrugations are formed a series of slots at right angles to the corrugations, the metal on either side of the slot being depressed into cup like shape, into which the mortar or plaster easily slides, and passing through forms a strong and perfect

it to the frame work, common nails only being required for attaching it in position. It is remarked by the makers that while the lath is used quite largely

the usual method is to wire it into place. The manufacturers state that the lath is especially adapted to the use of adamant or patent plaster, and that the rapidity and ease with which it may be applied to round, square or angular surfaces, together with the fact that it affords a firm holding surface for the plaster, and its fire proof qualities, recommend its use in buildings.

The Household Nail Box.

The H. P. Nail Company, Cleveland, Ohio, are putting on the market a nail box for household use, as illustrated in the accompanying cut. It is $9\frac{1}{2} \times 12\frac{1}{2}$ inches in size, made of $\frac{3}{8}$ -inch wood, substantially put together, and finished in the natural wood. The cover is hung with brass hinges, and the box is divided

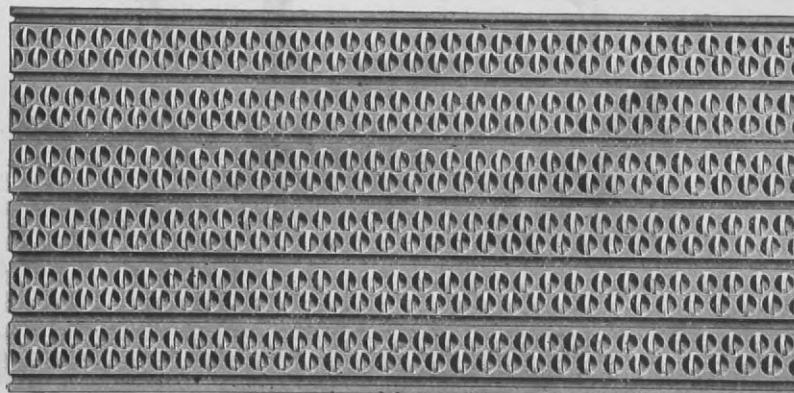
in buildings of wooden construction, it is principally used in strictly fire proof buildings in connection with iron beams



The Household Nail Box

and furring, and that it is in such construction that the rigidity and stiffness resulting from the corrugations make it

into 16 compartments, containing a good hammer, a supply of different sizes of wire nails, brads, tacks, double-pointed tacks, poultry netting and fence staples. The cover being raised, as it would be on a counter or showcase, a colored picture is presented to view with the following statements, one on each side : "A lady will find in this box a nail to fix a chair, a sofa, a bracket, a molding, a toy, a picture frame, &c. : " "A gentleman will find in this box a nail to fix a trunk, a door, a shelf, a fence, a chicken coop, a wheelbarrow, &c." The manufacturers state that the box contains enough nails and tacks to supply the demand of a home for several years. The boxes are packed one dozen in a crate.



The Piqua Metallic Lath.

key, requiring less plaster than other forms of lath. It is pointed out that the Piqua lath requires no stretching, stiffening pieces, or staples for securing

especially valuable, as the studding can be placed at least 2 feet apart, effecting a saving in the cost of studding. When the lath is used in connection with iron,

A COMPANY is about to be formed at Lynchburg, Va., with a view to manufacturing Agricultural Implements, Wagon Skeins, Farm Bells, Iron Fences, &c., and the Virginia Foundry Company, Box 72, Lynchburg, would be glad to receive catalogues and quotations from manufacturers of light machinery for such work.

The Electric Searcher Bicycle Lamp.

The Tillman Magneto-Dynamo Company, 237 Centre street, New York, for whom R. E. Rodriguez, 97 Chambers

Wires that may be run either inside or outside the tubing connect with the incandescent lamp, which is fitted with a powerful reflector, as shown in Fig. 3, weighing about 1 pound. The revolutions of the bicycle wheels generate a

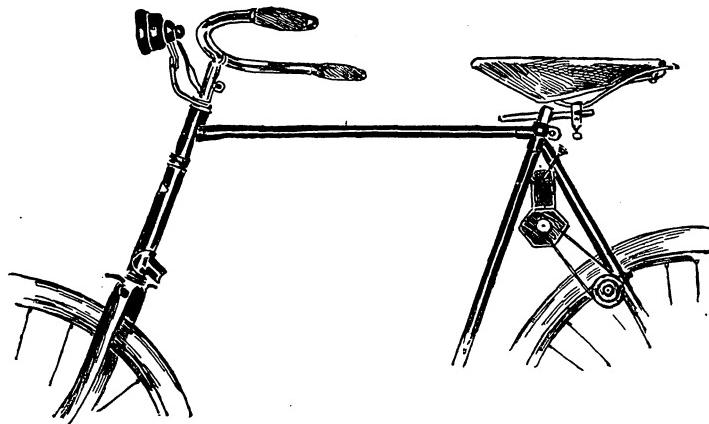


Fig. 1.—The Electric Searcher Bicycle Lamp.

street, is sales agent for the States of New York and New Jersey, are introducing an electric bicycle lamp, as here-with illustrated. The device attached to a bicycle ready for use is shown in Fig. 1, although it may be fastened to

power sufficient to run the lamp, which, with the aid of the reflector, throws a stream of light equal, it is claimed, to 16 candle power and sufficient to illuminate the road a distance of 17 feet ahead of the machine. As soon as the bicycle is started the lamp glows and grows brighter as the speed increases. When the light is not wanted the attachment can be quickly removed, or the disk may be slipped out of contact with the tire. The manufacturers remark that the lamp is always ready for use and brilliant; that it never leaks, smokes or grows hot, and that it does not require filling or trimming.

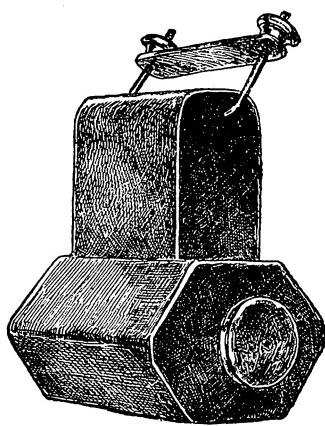


Fig. 2.—The Dynamo.

other parts of a machine. The dynamo, Fig. 2, which is illustrated in Fig. 1 fastened under the seat by thumb screws, is inclosed in a nickel box, $3\frac{1}{2} \times 4\frac{1}{2}$ inches in size, and weighs in the neighborhood of 2 pounds. It is run

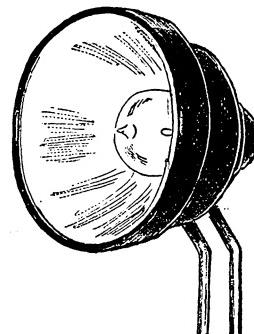


Fig. 3.—The Lamp and Reflector.

by means of a small disk that comes lightly in contact with the tire. The disk is on a small piece of shafting, which is connected with the axle of the dynamo by means of a thin steel belt.

a cushion for the garments when suspended. The hanger is made of white wood and is 15 inches long. There is

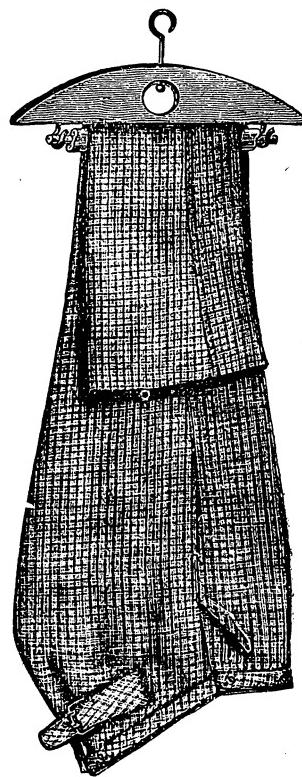


Fig. 1.—Plain Clothes Hanger No. 3.

an additional size for ladies' use on which to hang dresses. This article is of foreign invention and is being man-

Clipper Grinders.

A. J. Tracy Company, 18 Cliff street, New York, manufacturers and dealers in agricultural implements and machinery, have improved their line of Clipper grinders and largely increased the trade in these goods. Nos. 1, 2 and 3 are sizes adapted to household and mechanics' uses, suitable for grinding scissors, knives, plane irons, chisels, drawing knives and similar articles. They retail at from \$2 to \$6, according to size. The grinders have hollow and porous emery wheels revolved by a series of gears turned by a crank. The interior of the wheel is filled with water and the opening plugged. The water is forced through the emery by centrifugal force and keeps the cutting surface free. Nos. 4 and 5, larger machines, listed at \$10 and \$12.50 respectively, have solid emery wheels $6 \times 1\frac{1}{4}$ inches, and kept wet by a dripper above. These are power machines with both tight and loose pulleys, and suitable for use in shops.

Puck Clothes Hanger.

Van Wagoner & Williams Hardware Company, 14 Warren street, New York, are offering the Puck clothes hanger as shown in Figs. 1 and 2. They are intended to hold a complete suit of clothes, the vest and coat being supported by the oval form, while the trousers are held by the wood strip seen in the cut. Fig. 1 is a representation of the No. 3 plain hanger. Fig. 2 illustrates the No. 5, which has leather eyes at the sides, acting as

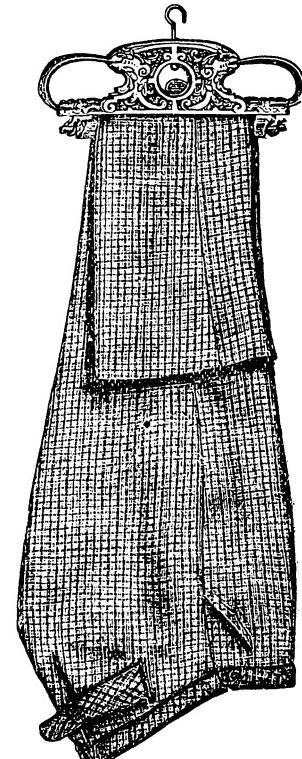


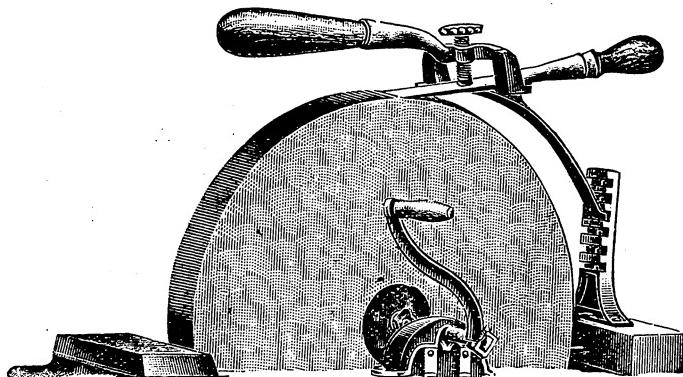
Fig. 2.—Clothes Hanger No. 5, with Leather Eyes.

ufactured for the American and Canadian markets exclusively by Van Wagoner & Williams Hardware Company.

The Wonder Tool Holder.

The illustration herewith given shows a tool holder which has been devised for the purpose of holding a tool firmly

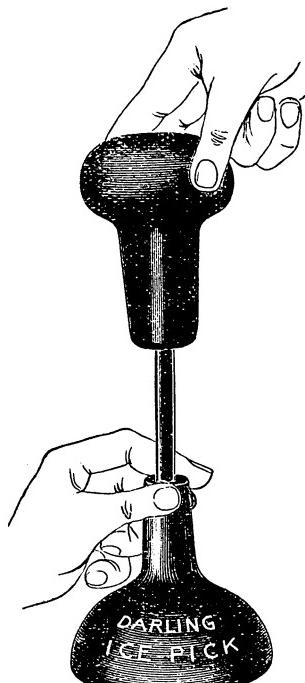
against the ice to prevent the particles from flying while the ice is being broken. The head or knob may also be used for breaking ice in the hand. The tool is finished in japan, and

*The Wonder Tool Holder.*

in one position while being ground. In the engraving a chisel is shown in position in the holder. The operator turns the grindstone crank with the right hand and places his left hand on the handle of the holder. The thumb screw keeps the tool rigid, in connection with the foot of the stand which is engaged in the teeth of the upright rack. It can be attached to any sized stone, for hand or steam power, and will hold any tool from the smallest chisel to a broad axe, while the tools thus held will be ground with a true bevel. It is made of the best gray iron, nicely japanned, and is fitted with a hard-wood handle. The manufacturer is T. C. Williams, Jr., 508 Royal Insurance Building, Chicago, and it is sold by Horton, Gilmore, McWilliams & Co., 173 to 176 Lake street, Chicago.

The Darling Ice Pick.

Darling Filter Company, 26½ South Water street, Cleveland, Ohio, are putting on the market the ice pick here

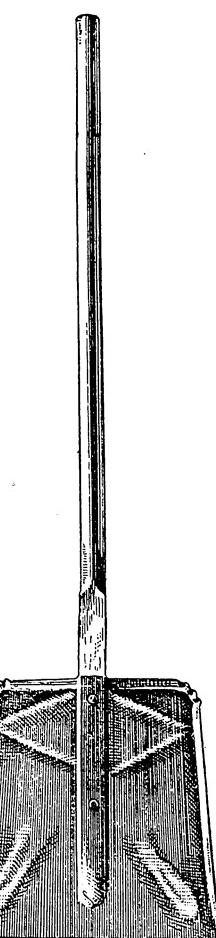
*The Darling Ice Pick.*

shown. The cast head slides upon the pointed rod when in use and forces it into the ice. The cast bell is held

claimed by the makers to possess desirable features peculiar only to itself.

The Peninsular Snow Shovel.

The cut herewith shown represents a shovel offered by the Peninsular Metal Works, Detroit, Mich. The blade is of

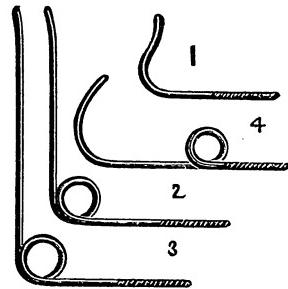
*The Peninsular Snow Shovel.*

steel, 14 x 16 inches in size, with an extra strong handle, well painted. In construction the lower corners are first turned, and then the edge is turned across the blade, resulting in three thicknesses of steel at the lower corners. The manufacturers remark that by this method they are enabled to use much lighter metal than in the ordinary shovel; that on the edge they obtain a

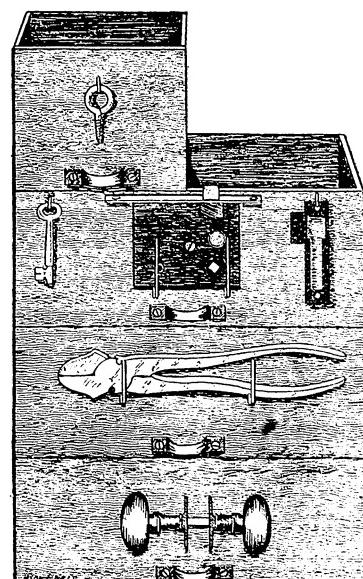
thickness equal to that of the heavier shovels, and that a much larger shovel is obtained than the ordinary make and of less weight, an important point in shoveling snow. It is explained that the direct strain on the point or corners of the blade is also relieved by the manner of folding, and that the blade is strengthened by corrugations. The point is brought out by the manufacturers that they are thus able to produce a shovel at a much less cost than that of ordinary goods of this kind, and at the same time furnish a large, light and desirable article. While the shovel was designed particularly for use in snow, the makers refer to it as a handy shovel for use about the house, barn or yard.

Herrick's Spring Hooks.

F. A. Herrick & Co., Jackson, Mich., are putting on the market improved spring hooks for sampling goods on

*Fig. 1.—Herrick's Spring Hooks.*

shelf boxes or drawers, as herewith illustrated. The hooks, as shown in Fig. 1, are made in four sizes of No. 14 tinned wire, and, it is remarked, do not obstruct the view of goods. The hooks are designed to be screwed into the boxes at the proper distance apart, and

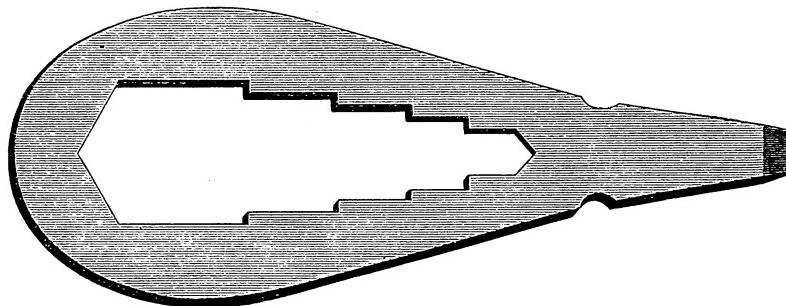
*Fig. 2.—Goods Sampled with Herrick's Hooks.*

to be used for sampling all kinds of shelf goods. The point is made that by the use of the spring hooks samples can be removed as easily as from a package, thus, if desired, always keeping a fresh sample in sight.

Combined Wrench and Screw Driver.

The accompanying illustration shows a combined wrench and screw driver, just brought out by the Coe Mfg. Com-

position for another operation. The extractor is provided with a wire stripper attached in a convenient place, adapted to remove wire caps or covers from all styles of bottles. The goods are furnished in solid bronze metal, also

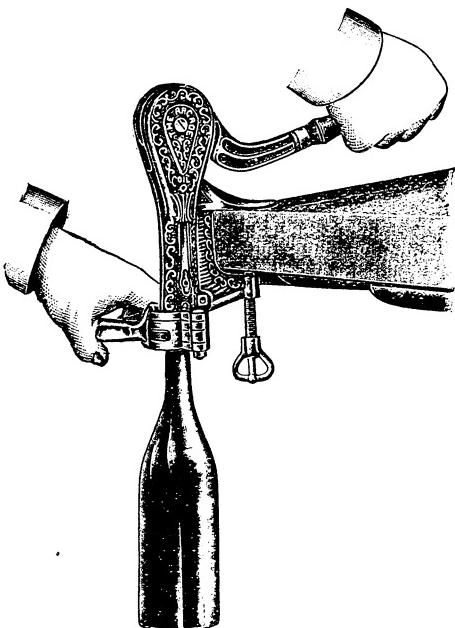


Combined Wrench and Screw Driver.

pany, 98 Duane street, New York. The general features of the tool, which is intended particularly for bicycle use, are shown so clearly in the illustration that no extensive description is necessary. The wrench is adapted to five sizes of nuts, from $\frac{1}{4}$ to $\frac{3}{4}$ inch, the intermediate sizes being $\frac{1}{2}$, $\frac{5}{16}$ and $\frac{11}{16}$ inch, and may be used with either square or hexagon nuts. The tool is made from $\frac{1}{2}$ inch steel, handsomely nickel plated, and the end is finished as a screw driver. The cut is the full size of the device.

Arcade Cork Extractor.

Arcade Mfg. Company, Freeport, Ill., are offering a cork extractor, as shown in the accompanying cut. A clamp is attached to the mouth of the puller, which, it is stated, when compressed by the hand will hold any size or shaped bottle securely in position while a cork is being drawn. The clamp is designed



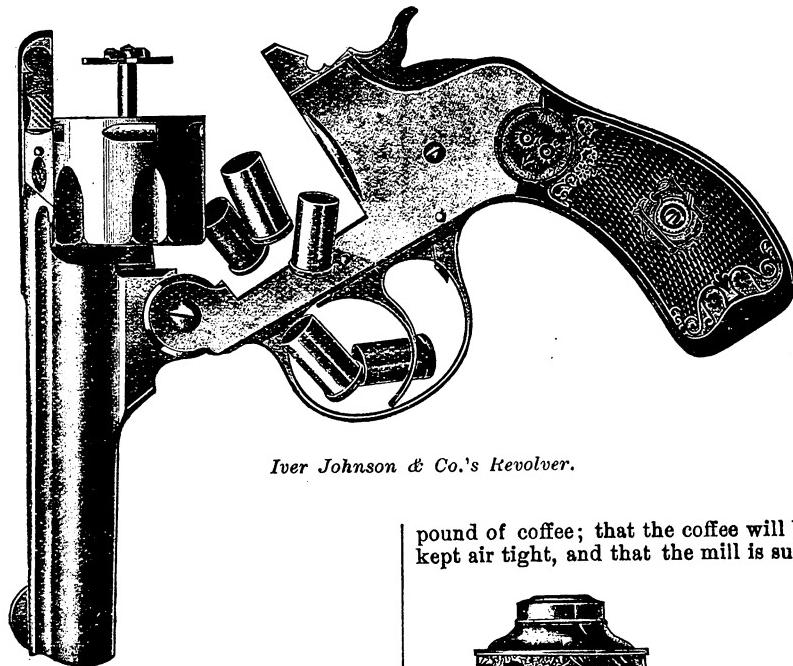
Arcade Cork Extractor.

to hold the bottle in perfect line with the screw, making it impossible for the screw to come in contact with the glass, causing the screw or the bottle to break, with disastrous results to the operator. The clamp is also designed to hold the bottle snugly to the machine, allowing the cork to receive the full benefit of the screw. One forward stroke of the lever draws the cork from a bottle, and reversing the lever discharges the cork from the screw, leaving the lever in

in cast iron polished and nickel plated, and are packed each in a substantial wooden box.

Iver Johnson & Co.'s Revolver.

The accompanying cut represents a new safety hammer automatic central fire double action revolver being intro-



Iver Johnson & Co.'s Revolver.

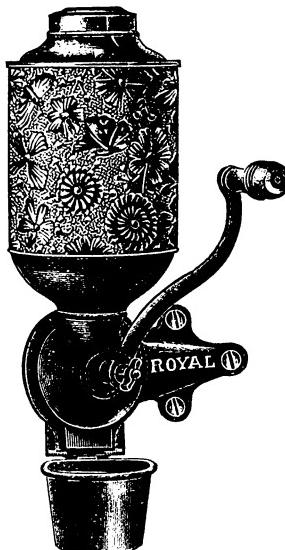
duced by Iver Johnson & Co., Fitchburg, Mass. The barrel is tilted forward and empty shells ejected by pushing up the checkered barrel catch above the cylinder, at the same time pressing down on the front end of the barrel. The barrel fastens automatically upon being returned to its original position, and, it is stated, the catch will never allow the barrel to fly open while firing. When the barrel is tilted forward the cylinder may be removed by pressing the round checkered bolt over the cylinder, at the same time pulling off the cylinder. When carrying the pistol loaded there is no danger of any explosion or accident, it is claimed, even if the hammer should catch in the pocket or in any other manner, as the pistol cannot be discharged unless the trigger at the same time be drawn completely back. The arm is so constructed that it cannot be exploded without considerable pressure on the trigger, the firing pin and the hammer being

separate and the hammer being entirely independent of the trigger. When raising the pistol to full cock, the raiser that lifts the hammer extends far enough to reach the firing pin, thus holding the trigger in position at the point where the hammer lets off at full cock. The hammer pushes the raiser against the firing pin to explode the cartridge. Unless the hammer is brought back where it lets off at full cock the firing pin is not forced against the cartridge. The firing pin returns at the same time that the trigger is allowed to come back to its normal position. The revolvers are well made, finished in nickel, with rubber handles. The illustration represents a 32 caliber, but the manufacturers expect to place a full line on the market.

New Royal Pound Mill.

The coffee mill here shown is offered by the Arcade Mfg. Company, Freeport, Ill. The mill is made of cast iron, finished in black enamel, and furnished with a fancy embossed sheet metal hopper. The fact that the mill fastens to the wall is a feature to which the manufacturers give prominence. They state that the hopper will hold a

pound of coffee; that the coffee will be kept air tight, and that the mill is sup-



New Royal Pound Mill.

plied with improved grinding burrs which do the work rapidly and with ease.

Current Hardware Prices.

AUGUST 1, 1894.

NOTE.—The quotations given below represent Current Hardware Prices, whether made by manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail Hardware merchants. Very small orders and broken packages often command higher prices.

The character @ is used to indicate a range of price: thus discount 50 & 10% @ 50 & 10 & 5%, signifies that the goods in question are sold at prices ranging from 50 & 10% to 50 & 10 & 5%.

Adjusters, Blind—

Domestic..... \$ doz \$3.00, 88%@\$3.44 & 10%
Excelsior..... \$ doz \$10.00, 50%@\$10.00
Worth's..... list net @ 10%
Thompson's—See Fasteners, Blind.

Ammunition—See Caps, Cartridges, Shells, &c.**Anvils—****American—**

Sagle Anvils, 1/2 lb. 9¢..... 15¢@15¢
Horse shoe brand, Wrought..... 11¢@11¢
Moore & Barnes Mfg. Co..... 38¢@38¢

Imported—

Armitage Mouse Hole..... 9¢@10¢
S. & H., machine finished..... 10¢@11¢
Trenton..... 9¢@10¢
Wilkinson's..... 10¢@10¢
Peter Wright's..... 10¢@11¢

Anvil Vise and Drill—

Allen Anvil and Vise \$3.00..... 40¢@10¢
Cheeny Anvil and Vise..... 25¢
Millers Falls Co. \$18.00..... 20¢
Holt's..... 40¢@40¢@10¢

Apple Parers—See Parers, Apple, &c.**Augers and Bits—**

Boring Machine Augers..... 70¢@70¢@10¢
Car Bits, 12-in. twist..... 60¢
Common Augers and Bits..... 70¢@70¢@10¢
Cincinnati Bell-Hangers' Bits..... 30¢@10¢
Forstner Pat. Auger Bits..... 15¢
Jennings' Pattern Car Bits..... 40¢
Jennings' Pattern Auger Bits..... 60¢
J. E. Jennings & Co., No. 10, extension
tip..... 40¢
O. E. Jennings & Co., No. 30..... 60¢
O. E. Jennings & Co., Auger Bits, W set
88% quarters, No. 5, 6; No. 30, \$3.50@25¢
Russell Jennings' Augers and Bits 25¢@10¢
Lewis' Patent Single twist..... 45¢
L'Hommedieu Car Bits..... 15¢@10¢
Pugh's Black..... 20¢
Pugh's Jennings Pattern..... 30¢
Shelli's Bits..... 60¢@60¢@10¢

Bit Stock Drills—

Cleveland..... 50¢@10¢
Cincinnati, for wood..... 30¢@10¢
Cincinnati, for metal..... 45¢@10¢
Morse Twist Drills..... 50¢@10¢@25¢
New Process Twist Drill Co. 50¢@10¢@25¢
Standard..... 50¢@10¢@25¢
Syracuse, for metal..... 50¢@10¢
Syracuse, for wood (wood lat.) 30¢@30¢@25¢

Expansive Bits—

Clark's small, \$18; large, \$26..... 40¢@40¢@25¢
Ives' No. 4, \$ doz \$60..... 40¢@40¢@10¢
Spears', No. 1, \$20; No. 2, \$18..... 40¢@40¢@10¢
Stearns' No. 2, \$48..... 20¢
Swan's..... 40¢@40¢@10¢

Gimlet Bits—

Bee..... 25¢@25¢@10¢
Common..... \$ gross \$2.50@25¢
Diamond..... \$ doz \$1.25..... 40¢@10¢
Double Cut.....
Hartwell's..... \$ gro. \$1.00, 40¢@10¢
Douglas'..... 40¢@10¢@25¢
Ives'..... 80¢@10¢@25¢@10¢
Shepardson's..... 45¢@10¢@25¢@10¢

Hollow Augers—

Bonney's Adjustable, \$ doz \$48..... 50¢
Cincinnati Adjustable..... 25¢@10¢
Cincinnati Standard..... 25¢@10¢
Douglas'..... 88%@88%@10¢
French, Swift & Co. (Beecher)..... 50¢@10¢@25¢
Ives'..... 88%@88%@10¢
Ives' Expansive, each \$4.50..... 50¢@10¢
Stearns'..... 20¢@10¢
Universal Expansive, each \$4.50..... 20¢
Wood's, \$ doz, \$48..... 25¢@10¢

Ship Augers and Bits—

L'Hommedieu's..... 15¢@10¢@15¢@10¢
Inell's..... 25¢@25¢@10¢
Snell's Ship Auger Patt'n Car Bits..... 15¢@10¢@15¢@10¢
Watrous'..... 25¢@25¢@10¢

Awl Hafts—See Hafts, Awl.**Awls—**

Brad, Handled..... \$ gr. \$2.50@25¢
Brad, Shouldered..... \$ gr. \$1.30@1\$1.40
Peg, Pat..... \$ gr. \$5¢@35¢
Peg, Should..... \$ gr. \$1.50@25¢
Scratch, Handled..... \$ gr. \$4.00@4.50
Scratch, Socket..... \$ doz \$1.10@1\$1.20

Awl and Tool Sets—See Sets, Awl and Tool.**Axes—**

First quality, best brands.... \$6.00@\$8.50
First quality, other brands.. 5.50@6.00
Beveled add 50¢ \$ doz.

Axle Grease—See Grease, Axle.**Axes—**

No. 1 Common..... \$ doz \$3.66
No. 2 Common..... 4¢@4¢
No. 7 to 14..... 7¢
No. 15 to 28..... 17¢@16¢
No. 19 to 22..... 17¢@16¢
Concord Axes, loose collar..... 8¢ cash
Concord Axes, solid collar..... 4¢@4¢
Tubular Axes..... 5¢@5¢@4¢

Bag Holders—See Holders, Bag.**Balances—**

Sash—
Caldwell, low list..... 30¢
Pullman..... 60¢

Spring—

Spring Balances..... 40¢@50¢
Chatillon, \$ doz..... 30.80 35¢ 1.75 net
Chatillon Straight Balances..... 40¢@40¢@10¢
Chatillon Circular Balances..... 50¢@10¢

Barb Wire—See Wire, Barb.**Bars—**

Crow—
Cast Steel..... \$ D 23¢@3¢
Iron, Steel Points..... \$ D 23¢@2¢@4¢

Basins, Wash—

Standard Fibreware, No. 1, 10% in. \$1.80;
12-inch, \$2.00; 13½-inch, \$2.50; 16-inch,
\$3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '82. 60¢@10¢
60¢@10¢@25¢
Chatillon's No. 1..... 40¢
Chatillon's No. 2..... 60¢@10¢@50¢@10¢
Custer's..... \$3.45

Beaters—

Egg—
Bryant's..... \$ gross \$14.00
Double (H. & R. Mfg. Co.)..... \$ gross, No. 0
\$12.00; No. 1, \$15.00; No. 2..... \$36.10

Dover..... \$ doz \$1.00@1.20
Dover (Standard Co.)..... \$ doz \$1.00

Duplex (Standard Co.)..... \$ doz \$1.00

Duplex Extra Heavy (Standard Co.)..... \$ doz \$2.50

Easy (H. & R. Mfg. Co.)..... \$ gro \$12.00

Improved Acme (H. & R. Mfg. Co.)..... \$ gro \$9.00

Silver & Co..... \$ doz \$5.50

Spiral..... \$ gro \$2.25 @ \$4.50

Triple (H. & R. Mfg. Co.)..... \$ gro \$16.50

Culinary—
Keystone, P. D. & Co., Each, No. 1, \$1.
No. 2, \$2..... 20¢

Bells—

Cow—
Common Wrought..... 60¢@10¢

Kentucky Durham..... 70¢@10¢@25¢

Kentucky, Sargent's list..... 70¢@10¢

Kentucky, "Star"..... 20¢@10¢

Texas Star..... 50¢@10¢@50¢@10¢

Western, Sargent's list..... 70¢@10¢

Door—

Crank, Brooks'..... 50¢@10¢@25¢

Crank, Cone's..... 10¢

Crank, Connel's..... 20¢@10¢

Gong, Abbe's..... 38¢@10¢@25¢

Gong, Barton's..... 40¢@10¢@50¢

Gong, Yankee..... 45¢@10¢@25¢

Lever, R. & E. Mfg. Co.'s..... 50¢@10¢@25¢

Lever, Sargent's..... 60¢@10¢@25¢

Lever, Taylor's Bronzed or Plated..... net

Pull, Brook's..... 50¢@10¢@25¢

Electric—

Bigelow & Dowse..... 20¢@20¢@10¢

Wollensak's..... 20¢@20¢@10¢

Hand—

Extra Heavy Brass..... 70¢@10¢@70¢@25¢

Light Brass..... 70¢@10¢@70¢@25¢

Silver Chime..... 38¢@10¢@25¢

White..... 20¢@10¢@25¢

Globe Cone's Patent..... 25¢@10¢@25¢

Call..... 45¢@50¢

Farm Bells..... \$ D 21¢

Steel Alloy Church and School Bells..... 50¢

Belts—

Blacksmiths'..... 60¢@10¢@20¢@70¢@25¢

Hand Belows..... 40¢@10¢@50¢@10¢

Molders'..... 40¢@10¢@50¢@10¢

Belting, Rubber—

Common Standard..... 75¢@10¢@75¢@10¢

Extra..... 80¢@10¢@80¢@10¢

Standard..... 70¢@10¢@70¢@10¢

N.Y.E.P.C. Co., Carbon..... 60¢@10¢@60¢@10¢

N.Y.E.P.C. Co., Double Diamond..... 60¢@10¢@60¢@10¢

N.Y.E.P.C. Co., 1846 Para..... 40¢@10¢@40¢@10¢

Brackets—

shelf, fancy.....

Sargent's list..... 70¢@70¢@10¢

Other makes at a wide range of prices.

shelf, plain.....

Regular, list..... 65¢@70¢@10¢

Sargent's list..... 60¢@10¢@70¢@10¢

Rose & Johnson..... 50¢@70¢@10¢

Brackets—

shelf, fancy.....

Sargent's list..... 70¢@70¢@10¢

Other makes at a wide range of prices.

shelf, plain.....

Regular, list..... 65¢@70¢@10¢

Sargent's list..... 60¢@10¢@70¢@10¢

Rose & Johnson..... 50¢@70¢@10¢

Bench Stops—See Stops, Bench**Benders and Upsetters, Tire—**

Detroit Perfected Tire Bender 15¢@15¢@10¢

Green River Tire Benders and Upsetters..... 20¢

Stoddard's Lightning Tire Upsetters..... 15¢

Bits—

Auger, Gimlet, Bit Stock Drills, &c.,

see Augers and Bits.

Bit Holders—See Holders.**Blind Adjusters—See Adjusters, Blind.****Blind Fasteners—See Fasteners, Blind.****Blind Staples—See Staples, Blind.****Blocks—**

Cleveland Block Co., Mal. Iron..... 50¢@10¢@50¢@10¢

Moore's Novelty, Mal. Iron..... 50¢@50¢@50¢@10¢

Super Grin Stoen Tackles Blocks 2¢@2¢@5¢@10¢

See also Machines Hoisting.

Bolts—**Carriage, Machine, &c.—**

Com. list June 10, '84..... 80¢@10¢@80¢@10¢@5¢

Charter Oak, list Oct. 1884..... 80¢

Genuine Eagle, Norway, list Oct. '84.....

80¢@80¢@10¢@10¢@5¢

Eagle, Norway, list Oct. '84..... 80¢@80¢@10¢@10¢@5¢

Phila. pattern, list Oct. 7, '84..... 80¢

R.B.W. & Co., old list..... 70¢

Bolt Ends, list Jan. 1, 1890. 80¢@10¢@80¢@20¢

Machine, list Jan. 1, 1890. 80¢@10¢@80¢@20¢

Cast Iron Barrel Square, &c.,

75¢@10¢@75¢@10¢@5¢

Cast Iron Chain (Sargent's list),

65¢@10¢@65¢@10¢@5¢

Cast Iron Shutter Bolts, 75¢@10¢@75¢@10¢@5¢

Plate		45
Bomer's Night Latches		154
R. & H. Mfg. Co., list Mar. 20, 1889		60&10/60/70
Sargent & Co., list July, 1894	60&10/60/70	60
Warner's Burglar Proof, # doz. \$3.00, 50¢		
Elevator		884
'Padlocks-		
Wrought Iron Padlocks:		
Brittan, Graham & Mathes, list Jan., 1894		75%
Mallory, Wheeler Co., list Jan. 1, 1894		70%
Norwich Lock Mfg. Co., list June 10, 1891	50&2%	
Russell & Erwin Mfg. Co., list June 10, 1891	50&2%	
Sargent & Co., list January 1, 1894	75%	
William Wilcox Mfg. Co., list January 1, 1894	75&20%	
Ames Sash Co. up to No. 103 incl.	50%	
Ames Sword Co. above No. 103	50&10%	
Barnes Mfg. Co.	40&40/20/10	
Champion Padoocks	40%	
A. E. Deitz	40%	
Eagle	40%	
Eureka, Eagle Lock Co.	40&2%	
E. T. Frazee's Keystone Scandinavian,		
1010 line	90&2%	
120 line	90&25%	
109 line	65%	
510 line	70&10%	
225, 610 and 209 lines	70%	
All other numbers	50&5%	
Horseshoe	# doz \$9, 50c 50&10/10	
Hotchkiss	30%	
Nock's	30%	
Bomer's Nos. 0 to 91	30%	
Bomer's Scandinavian, &c., Nos. 100 to 505	15%	
Scandinavian	90&20%	
Haymaker, Barry & Co.		
No. 1010 line	90%	
No. 41 line	50%	
No. 01 line	50%	
No. 21 line	70%	
No. 109 line	90&4%	
Star	60%	
Yale Lock Mfg. Co.'s	net prices	
Sash, &c.-		
Attwell Mfg. Co.	25&33/4%	
Champion Safety List, January, 1893	70&5%	
Clark's No. 1, \$10; No. 2, \$8 gr.	33/4%	
Common Sense, Jap'd, Cop'd and Brzd.	40¢ per doz.	
Common Sense, Nickel Plated	# gr \$10.00	
Corbin's Daisy, list Feb. 15, 1886	70%	
Davis Bronze, Barnes Mfg. Co.	60%	
Ferguson's	88/4%	
Fish (Lieches' pat.), No. 100, # gr. 68		
No. 105, # gr. 110	50%	
Giant, list Jan. 1892	70&10%	
Hammond's Window Springs	40%	
Huglin's New Sash Locks	25&2/2%	
Huglin's Sash Balance	25&2/2%	
Ivee's Patent	60&10/50&60/10&10/5%	
Kempshall's Gravity	60%	
Kempshall's Model	60&60/10/5%	
Monarch	50%	
Fayson's Perfect	60&10/10/5%	
Reading	60&10/10&60/4&10/10/5%	
Security	70%	
Universal	30%	
Victor	60&10/2/2%	
Walker's	10%	
Wolcott's	60&10/5%	
Lumber Tools-		
See Tools, Lumber.		
Lustro-		
Four-ounce bottles	# doz. \$1.75; # gross.	\$17.00
Machines.		
Boring-		
Without Augers. Upright, Angular.		
Boss, Carpenters' 3.60		
Boss, Ship Bldrs' 3.85		
Douglas.....\$5.50 6.75.....50%		
Jennings.....5.50 6.75....50/50&5%		
Millers Falls.....7.50.....35%		
Phillip's Patent with Auger.....7.00 7.50.....		
Small's, Rice's Pat. 5.50 6.75....40&10&10%		
Fluting-		
American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each.	35%	
Combined Fluter and Sad Iron		
Crown, 4½ in., \$3.50; 6 in., \$4.00; 8 in., \$5.50 each.	35%	
Crown Hand Fluter, No. 1, \$15.00; 2, \$12.50; 3, \$10.00; 4, \$8.25	30%	
Crown Jewel, 6 in. ....\$3.50 each	150	
Domestic Fluter.....each, \$1.50		
Eagle, ¾-inch Rolls \$2.15.....35%		
Eagle, ½-inch Rolls \$2.85.....35%		
Knox, ¾-inch Rolls.....\$3.25 each	35%	
Knox, ½-inch Rolls.....\$3.60 each	35%	
Hoisting-		
Moore's Anti-Friction Differential Pulley Block	20%	
Moore's Hand Hoist, with Lock Brake	20%	
Moore's Rope Differential Pulley Block	60%	
Maris & Beekley (Teal Patent)	30%	
See also Blocks.		
Washing-		
Fair and Square	# doz \$42.00	
Anthony Wayne, # doz. No. 1, \$42; No. 2, \$38; No. 3, \$24.		
Wayne American	# doz \$34.00	
Weissel	# doz \$54.00	
Western Star # doz. No. 2, \$36 No. 3 \$39		
Mallets-		
B. & L. Block Co., Hickory & L. V.	30&10/40/10%	
Whre Head, Stearns	33/4%	
Hickory	20&10/20&10/10%	
Signumvites	20&10/20&10/10%	
Mattocks —Regular list.		
60&10/60&10/5%		
Measures-		
Standard Fibware, No. 1, peck # dozen, \$3.50; ¼ peck, \$3.00		
Meat Cutters-		
See Cutters, Meat.		
Pails-		
Moore's	884	
'Padlocks-		
Wrought Iron Padlocks:		
Brittan, Graham & Mathes, list Jan., 1894	75%	
Mallory, Wheeler Co., list Jan. 1, 1894	70%	
Norwich Lock Mfg. Co., list June 10, 1891	50&2%	
Russell & Erwin Mfg. Co., list June 10, 1891	50&2%	
Sargent & Co., list January 1, 1894	75%	
William Wilcox Mfg. Co., list January 1, 1894	75&20%	
Ames Sash Co. up to No. 103 incl.	50%	
Ames Sword Co. above No. 103	50&10%	
Barnes Mfg. Co.	40&40/20/10	
Champion Padoocks	40%	
A. E. Deitz	40%	
Eagle	40%	
Eureka, Eagle Lock Co.	40&2%	
E. T. Frazee's Keystone Scandinavian,		
1010 line	90&2%	
120 line	90&25%	
109 line	65%	
510 line	70&10%	
225, 610 and 209 lines	70%	
All other numbers	50&5%	
Horseshoe	# doz \$9, 50c 50&10/10	
Hotchkiss	30%	
Nock's	30%	
Bomer's Nos. 0 to 91	30%	
Bomer's Scandinavian, &c., Nos. 100 to 505	15%	
Scandinavian	90&20%	
Haymaker, Barry & Co.		
No. 1010 line	90%	
No. 41 line	50%	
No. 01 line	50%	
No. 21 line	70%	
No. 109 line	90&4%	
Star	60%	
Yale Lock Mfg. Co.'s	net prices	
Sash, &c.-		
Attwell Mfg. Co.	25&33/4%	
Champion Safety List, January, 1893	70&5%	
Clark's No. 1, \$10; No. 2, \$8 gr.	33/4%	
Common Sense, Jap'd, Cop'd and Brzd.	40¢ per doz.	
Common Sense, Nickel Plated	# gr \$10.00	
Corbin's Daisy, list Feb. 15, 1886	70%	
Davis Bronze, Barnes Mfg. Co.	60%	
Ferguson's	88/4%	
Fish (Lieches' pat.), No. 100, # gr. 68		
No. 105, # gr. 110	50%	
Giant, list Jan. 1892	70&10%	
Hammond's Window Springs	40%	
Huglin's New Sash Locks	25&2/2%	
Huglin's Sash Balance	25&2/2%	
Ivee's Patent	60&10/50&60/10/5%	
Kempshall's Gravity	60%	
Kempshall's Model	60&60/10/5%	
Monarch	50%	
Fayson's Perfect	60&10/10/5%	
Reading	60&10/10&60/4&10/10/5%	
Security	70%	
Universal	30%	
Victor	60&10/2/2%	
Walker's	10%	
Wolcott's	60&10/5%	
Lumber Tools-		
See Tools, Lumber.		
Lustro-		
Four-ounce bottles	# doz. \$1.75; # gross.	\$17.00
Machines.		
Boring-		
Without Augers. Upright, Angular.		
Boss, Carpenters' 3.60		
Boss, Ship Bldrs' 3.85		
Douglas.....\$5.50 6.75.....50%		
Jennings.....5.50 6.75....50/50&5%		
Millers Falls.....7.50.....35%		
Phillip's Patent with Auger.....7.00 7.50.....		
Small's, Rice's Pat. 5.50 6.75....40&10&10%		
Fluting-		
American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each.	35%	
Combined Fluter and Sad Iron		
Crown, 4½ in., \$3.50; 6 in., \$4.00; 8 in., \$5.50 each.	35%	
Crown Hand Fluter, No. 1, \$15.00; 2, \$12.50; 3, \$10.00; 4, \$8.25	30%	
Crown Jewel, 6 in. ....\$3.50 each	150	
Domestic Fluter.....each, \$1.50		
Eagle, ¾-inch Rolls \$2.15.....35%		
Eagle, ½-inch Rolls \$2.85.....35%		
Knox, ¾-inch Rolls.....\$3.25 each	35%	
Knox, ½-inch Rolls.....\$3.60 each	35%	
Hoisting-		
Moore's Anti-Friction Differential Pulley Block	20%	
Moore's Hand Hoist, with Lock Brake	20%	
Moore's Rope Differential Pulley Block	60%	
Maris & Beekley (Teal Patent)	30%	
See also Blocks.		
Washing-		
Fair and Square	# doz \$42.00	
Anthony Wayne, # doz. No. 1, \$42; No. 2, \$38; No. 3, \$24.		
Wayne American	# doz \$34.00	
Weissel	# doz \$54.00	
Western Star # doz. No. 2, \$36 No. 3 \$39		
Mallets-		
B. & L. Block Co., Hickory & L. V.	30&10/40/10%	
Whre Head, Stearns	33/4%	
Hickory	20&10/20&10/10%	
Signumvites	20&10/20&10/10%	
Mattocks —Regular list.		
60&10/60&10/5%		
Measures-		
Standard Fibware, No. 1, peck # dozen, \$3.50; ¼ peck, \$3.00		
Meat Cutters-		
See Cutters, Meat.		
Pails-		
Moore's	884	
'Padlocks-		
Wrought Iron Padlocks:		
Brittan, Graham & Mathes, list Jan., 1894	75%	
Mallory, Wheeler Co., list Jan. 1, 1894	70%	
Norwich Lock Mfg. Co., list June 10, 1891	50&2%	
Russell & Erwin Mfg. Co., list June 10, 1891	50&2%	
Sargent & Co., list January 1, 1894	75%	
William Wilcox Mfg. Co., list January 1, 1894	75&20%	
Ames Sash Co. up to No. 103 incl.	50%	
Ames Sword Co. above No. 103	50&10%	
Barnes Mfg. Co.	40&40/20/10	
Champion Padoocks	40%	
A. E. Deitz	40%	
Eagle	40%	
Eureka, Eagle Lock Co.	40&2%	
E. T. Frazee's Keystone Scandinavian,		
1010 line	90&20%	
120 line	90&25%	
109 line	65%	
510 line	70&10%	
225, 610 and 209 lines	70%	
All other numbers	50&5%	
Horseshoe	# doz \$9, 50c 50&10/10	
Hotchkiss	30%	
Nock's	30%	
Bomer's Nos. 0 to 91	30%	
Bomer's Scandinavian, &c., Nos. 100 to 505	15%	
Scandinavian	90&20%	
Haymaker, Barry & Co.		
No. 1010 line	90%	
No. 41 line	50%	
No. 01 line	50%	
No. 21 line	70%	
No. 109 line	90&4%	
Star	60%	
Yale Lock Mfg. Co.'s	net prices	
Sash, &c.-		
Attwell Mfg. Co.	25&33/4%	
Champion Safety List, January, 1893	70&5%	
Clark's No. 1, \$10; No. 2, \$8 gr.	33/4%	
Common Sense, Jap'd, Cop'd and Brzd.	40¢ per doz.	
Common Sense, Nickel Plated	# gr \$10.00	
Corbin's Daisy, list Feb. 15, 1886	70%	
Davis Bronze, Barnes Mfg. Co.	60%	
Ferguson's	88/4%	
Fish (Lieches' pat.), No. 100, # gr. 68		
No. 105, # gr. 110	50%	
Giant, list Jan. 1892	70&10%	
Hammond's Window Springs	40%	
Huglin's New Sash Locks	25&2/2%	
Huglin's Sash Balance	25&2/2%	
Ivee's Patent	60&10/50&60/10/5%	
Kempshall's Gravity	60%	
Kempshall's Model	60&60/10/5%	
Monarch	50%	
Fayson's Perfect	60&10/10/5%	
Reading	60&10/10&60/4&10/10/5%	
Security	70%	
Universal	30%	
Victor	60&10/2/2%	
Walker's	10%	
Wolcott's	60&10/5%	
Lumber Tools-		
See Tools, Lumber.		
Lustro-		
Four-ounce bottles	# doz. \$1.75; # gross.	\$17.00
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Champion Padoocks	40%	
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Eureka, Eagle Lock Co.	40&2%	
E. T. Frazee's Keystone Scandinavian,		
1010 line	90&20%	
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Common Sense, Jap'd, Cop'd and Brzd.	40¢ per doz.	
Common Sense, Nickel Plated	# gr \$10.00	
Corbin's Daisy, list Feb. 15, 1886	70%</td	

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.) 65
Andrews 50
Covert's Saddlery Works' Triumph 82
Covered Spring 60 & 10 & 10
Covert 50 & 10 & 5 & 5
Covert, New Patent 50 & 10 & 5 & 5
Covert, New R. E. 60 & 10 & 5 & 5
Fitch's (Bristol) 60 & 10 & 5 & 5
German, new list 40 & 10
Hotchkiss 10
Kelley & Woolworth's Steel Harness 50 & 10 & 10
John Prots Snaps 75 & 75 & 5
Sargent's Patent Guarded 70 & 10 & 10 & 10 & 10
Snaths—
Scythe 50 & 2 & 50 & 10
Soldering Irons—
See *Iron, Soldering*.

Spltoons Cuspidors, &c.—
Standard Fiberware—
Cuspidors, 8½-inch, \$1 doz.; No. 6, \$5; No. 52, \$9.
Spltoons, Daisy, 8-inch, No. 1, 4 10 and 11 inch, \$6.

Spoke Shaves—
See *Shaves, Spoke*.

Spoke Trimmers—
See *Trimmers, Spoke*.

Spoons and Forks—
Tinned Iron—

Basting, Cen. Stamp. Co.'s list 70 & 25
Buffalo, S. S. & Co. 35 & 25
Solid Table and Tea, Cen. Stamp. Co.'s list 70 & 25

Silver Plated—
4 months or 56 cash 30 days:

L. Boardman & Son 50 & 12 & 5
Holmes & Edwards Silver Co. 40, 15 & 5
Meriden Brit. Co., Rogers 40 & 15
Reed & Barton 40 & 10 & 5
Rogers & Bros. 40 & 15
C. Rogers & Bros. 40 & 15
Rogers & Hamilton 40 & 15
Wm. Rogers Mfg. Co. 40, 15 & 5
Simpson, Hall, Miller & Co. 40, 15 & 5
Miscellaneous—
Boardman's Britannia Spoons, case lot 60 & 25 cash
Boardman's Nickel Silver, 1st July 1, 1891 60 & 7 & 5
Britannia 60 & 60 & 5
German Silver 50 & 50 & 25
Nickel Silver 50 & 50 & 25 cash
Holmes & Edwards Silver Co.:
No. 24 German Silver 50 & 10 & 5
No. 30 Silver Metal 50 & 10 & 5
No. 49 Nickel Silver 50 & 10 & 5
No. 50 Nickel Silver 50 & 5
No. 67 Mexican Silver 50 & 10 & 5
Rogers Hamilton:
Climetar, Flatware 40 & 15 & 5
Climetar, Steel Goods 40 & 10 &
Crown Hamilton, Flatware and Cutlery 40 & 10 &
Steel Goods 40 & 10 &
Wm. Rogers Mfg. Co.:
18% Rogers' German Silver 60 & 5
25% Rogers' Nickel Silver 50 & 5
Rogers' Silver Metal 50 & 10 & 5
Springs - Door—
Champion (Coll.) 55 & 10 & 55 & 10 & 5
Cowell's, No. 1, \$1 doz. \$18.00; No. 2, \$15.00 60 & 10 & 50 & 10 & 5
Gem (Coll.), list April 19, 1886 50 & 10 & 5
Hercules 50 & 10 & 5
Phoenix 32 & 12 & 15 & 5
Rubber, complete, \$1 doz. 45 lb. 65% & 70%
Star (Coll.), list April 19, 1886 50 & 10 & 5
Torrey's Rods, 39 in. 4 doz. \$1.20 & 1.25
Warner's No. 1, \$1 doz. \$1.50; No. 2, \$3.40 55 & 55 & 10 &
Victor (Coll.) 60 & 10 & 60 & 10 & 5
Carriage, Wagon, &c.—
Elliptic Concord, Platform and Half Scroll 60 & 10 & 60 & 10 & 5 or net prices
Coll's Bolster Springs 25
Sprinklers, Lawn—
Gibbs' Arc \$1 doz. \$12.00
Gibbs' Hustler \$1 doz. \$10.00
Squares—
Nickel-Plated { 85 & 85 & 5
Steel and Iron 85 & 85 & 5
Try Square and T Bevels 60 & 10 & 10 &
Avery's Bevel Protractor 50
Avery's Flush Bevel Squares 50
Dissot's Try Square and T Bevels 50
Starrett's Micrometer Calliper Squares 25
Winterbottom's Try and Miter 30 & 10 &
Squeezers—
Fodder—
Blair's \$1 doz. \$2.00
Blair's "Climax" \$1 doz. \$1.00
Lemon—
Porcelain Lined, No. 1. \$1 doz. \$4.00
25 & 30 &
Wood, Common \$1 doz. \$1.70 & 1.75
Wood, No. 2, \$1 doz. \$3.00, \$5.50
Dean's, No. 1, \$1 doz. \$6.50; 2, \$3.35; 3, \$1.90; Queen, \$2.50
Dunlap's Improved \$1 doz. \$3.75 & 20
Hotchkiss Straight Flash \$1 doz. \$12.00
Jennings' Star \$1 doz. \$2.50
King 40 & 55
Little Giant 50 & 50 & 5
Sammis, No. 1, \$5.00; No. 2, \$9; 12, \$18 & doz. 25 & 10 &
The Boss \$1 doz. \$2.50
Standard Fiber Ware—
See *Ware, Standard Fiber*.

Staples—
Barbed Blind, 1/4 in. and larger, \$1 & 7 & 7 & 5
Barbed Blind, 1/4 in. \$1 doz. \$2.50 &
Fence Staples, Galvanized, as B'nd Wire
Fence Staples, Plain, See *Trd. Rep.*
Grand Crossing Tack Co.'s list 75 & 10 &
Steels Butchers'—
C. & A. Hoffmann's 40
Nichols Bros 50
Steelyards—
Stocks and Dies—
Blacksmith's:
Butterfield's Goods 35
Waterford Goods 35
Gardiner 25
Green River 35 & 30
Lightning Screw Plate 25 & 30
Reece's New Screw Plates 25 & 30
Reversible Ratchet 30 &
Stone—
Stones, Grind—See *Grindstones*.
Soyte Stones—
Pike Mfg. Co., list April, 1892 88 & 5
Levitated Stone Co., list Nov. 1892, 88 & 5

Oil Stones, &c.—
Pike Mfg. Co.,
Hindman No. 1, \$1 doz. 85
Sand Stone 55
Turkey Oil Stone, 4 to 8 40 & 10 &
In 10 &
Turkey Slips \$1.00
Lily White Washita 60 &
Rosy Red Washita 60 &
Washita Stone, Extra 50
Washita Stone, No. 1 40
Washita Stone, No. 2 30
Lily White Slips 90 &
Rosy Red Slips 90 &
Washita Slips, Extra 80 &
Washita Slips, No. 1 70 &
Arkansas Stone, No. 1, 8 to 12, \$1.20 & 1.25
Arkansas Stone, No. 15 to 20, \$1.50 &
Lake Superior \$1 doz. 13 &
Lake Superior Slips \$1 doz. 20 &
Tanite Mills:
Emery Oil \$1 doz. \$9.00. 50 & 65 &
Stops, Bench—
Cincinnati 25 & 10 &
Crescent \$1 doz. \$1.50
Hotchkiss' \$1 doz. \$5. 10 & 10 &
McGills \$1 doz. \$3 10 &
Millers Falls 25
Morrill's, \$1 doz. No. 1, \$11.00; No. 2, \$11.00 40 & 20 &
Stearns' 20 & 10 &
Terrell's Nos. 1 and 2, \$1 doz. \$3; No. 3, \$3.60 30 &
Weston's, No. 1, \$10; No. 2, \$9.25 & 10 & 5
Stove Polish—
See Polish, Stove.

Stretchers Carpet—
Cast Iron, Steel Points \$1 doz. 75 & 80
Cast Steel, Polished \$1 doz. \$2.25
Socket \$1 doz. \$1.75
Bullard's 25 & 10 & 40 &
Straps, Razor—
Badger's Belt and Comb \$1 doz. \$2.00
Campbell Cutlery Co. Net prices
Electric Cutlery Co. Net prices
Genuine Emerson 60 & 60 & 5
Imitation \$1 doz. \$2.00, 20 & 10 & 5
Jordan's Pat. Padded, list Nov. 1, '93, 50 &
Lamont Combination \$1 doz. \$4.00 Net prices
Torrey's Net prices

Stuffing Sausage—
Miles' Challenge, \$1 doz. \$2.00 50 & 50 & 5 &
Perry \$1 doz. No. 1, \$15.00; No. 0, \$21.00 50 & 50 & 50 & 10 &
Draw Cut No. 4, each \$3.00 20 &
Enterprise Mfg. Co., list Jan. 17, '93, 25 &
Silver's 40 & 10 &
Sweepers, Carpet and Lawn Carpet—
Aome \$1 doz. \$26.00
Advance \$1 doz. \$18.00
Banner Jap'd, \$1 doz. \$22.00; Nickel, \$24.00
Grand \$1 doz. \$36.00
Gold Medal \$1 doz. \$27.00
Prize \$1 doz. \$27.00
Superior \$1 doz. \$27.00
Cosmopolitan \$1 doz. \$27.00
Furniture Protector, Jap. \$1 doz. \$24.00
Inten Ocean \$1 doz. \$27.00
Hall \$1 doz. \$48.00
Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00 18 &
Domestic \$1 doz. \$21.00 20 &
Easy, Jap'd, \$1 doz. \$22.00; Nickel, \$24.00 22 &
Excelsior \$1 doz. \$22.00 20 &
Our Leader \$1 doz. \$19.00 20 &
Rapid, Jap'd, \$1 doz. \$22.00; Nickel, \$24.00 20 &
Reliable \$1 doz. \$22.00 20 &
Select \$1 doz. \$24.00 20 &
Standard \$1 doz. \$24.00 20 &
Supreme \$1 doz. \$22.00 20 &
The Star \$1 doz. \$21.00 20 &
Triumph \$1 doz. \$20.00 20 &
Bissell Carpet Sweeper Co. make the following robes:
\$1.00 per doz. in 5 doz. lots.
\$2.00 per doz. in 10 doz. lots.

Lawn—
Thompson Mfg. Co. 30 &
David's Lawn 25 &
Tacks, Brads &c.—
List October 19, 1889. Old established straight Weights. Short Weight goods are sold at lower prices.
Carpet Tacks—
American, Blued 47 &
American, Blued, Th'd and Cop'd 62 &
Steel, Bright and Blued 47 &
Steel, Tinned and Coppered 52 &
Swedes Iron, S. S. 47 &
Swedes Iron, S. S. Thinned 47 &
American Iron Tacks, Domestic, 37 &
American Iron Tacks, Foreign, 50 &
Swedes Iron Tacks—
S. S. Blued 37 &
S. S. Threaded 45 &
Lanc. Blued 30 &
Lanc. Tinned 37 &
Upholsterers, S. S. 47 &
Upholsterers, Lanc. 37 &

Gimp Tacks—
S. S. Blued 30 &
S. S. Tinned 42 &
Lanc. Blued 20 &
Lanc. Tinned 35 &
Basket and Trimmers' Tacks—
Lanc. 20 &
S. S. 25 &
Hungarian Nails 35 &
Common and Patent Brads 35 &
Leathered Tacks 52 &
Brush Tacks and Nails, S. S. 20 &
Looking Glass Tacks, S. S. 55 &
Picture-Frame Points, S. S. 12 &
Lace Tacks Blued 12 &
Lace Tacks, Tinned 20 &
Finishing Nails 52 &
Trunk and Clout Nails—
Black 52 &
Tinned or Coppered 57 &
Basket Nails 37 &
Chair Nails 35 &
Cigar Box Nails 30 &
Tim Capped Nails 50 &

Miscellaneous—
double Point 85 & 10 & 85 & 10 & 10 &
Wire Carpet Nails 60 & 10 & 60 & 10 & 10 &
Bill Nye Brad Box 40 & 10 & 40 &
Bonnie Blue \$1 doz. 51 &
Caw Range Carpet \$1 gross \$4.00
Home Tacks, No. 50, \$1 case (12 cartons), \$5.00 50 & 25 &
(12 cartons), \$7.00 50 &
Home Nails, No. 200, \$1 case (12 cartons), \$8.00 50 &
No. 400, \$1 case (12 cartons), \$9.00 50 &
Parisian Gilt Nails, cartoon 50 &
Plymouth Rock Carpet Tacks 20 &
Upholsterers' Nails 50 & 10 &
See also *Nails, Wires*.

Wire Brads and Nails—
Steel-Wire Brads, R. & E. Mfg. Co.'s list 50 & 10 & 10 &

See also *Nails, Wires*.

Tanks Oil—
Emerald, S. S. & Co.: 30-gal. \$8.75; 60-gal. \$11 each. 50 & 10 & 5 &

Tapes, Measuring—
American 40 & 10 & 5 &
Chesterman's, Regular list 30 & 30 & 5 &
Excelsior, Special list 20 &
Spring 40 &

Thermometers—
Tim Case 80 & 80 & 10 &

Thimble Skeins—See *Skeins*.

Ties Bale—Steel.

Standard Wire, list 50 & 10 & 5 &

Tinners' Shears, &c.—
See *Shears, Tinners' to*.

Tinware—
Stamped, Gilded, and Plated, list Jan. 20, 1887 70 & 10 & 70 & 25 &

Tire Benders, Upsetters, &c.—
See *Benders and Upsetters*.

Tobacco Cutters—
See *Cutters, Tobacco*.

Tools—
Coopers'—

Albertson Mfg. Co. 25 &

Benton's 20 & 20 & 5 &

Beatty's 33 & 5

Bradley's 20 &

Sandusky Tool Co. 30 & 30 & 5 &

Shaver Cincinnati Tool Co. 20 &

L. & J. White 20 & 5 &

Lumber—
Cant Hooks, "Blue Line" \$1 doz. \$18.00

Cant Hooks, Common Finish, \$1 doz. \$14.00

Cant Hooks, Mail, Socket Clasp, Common Finish \$16.00

Cant Hooks, Clip Clasp, "Blue Line" \$14.00

Cant Hooks, Clip Clasp, Common Finish \$12.00

Hand Spikes \$1 doz. 6 ft. \$15.00; 8 ft. \$20.00

Pike Poles, Pike & Hook, \$1 doz. 12 ft. \$11.50; 14 ft. \$12.50; 16 ft. \$14.50

Pike Poles, Pike only, \$1 doz. 12 ft. \$10.00; 14 ft. \$11.00; 16 ft. \$13.00; 18 ft. \$16.00; 20 ft. \$20.00

Pike Poles, Pike not ironed, \$1 doz. 12 ft. \$11.50; 14 ft. \$12.50; 16 ft. \$14.50

Mall, Iron Socket Peavies \$1 doz. \$19.00

Ring Peavies, "Blue Line" \$1 doz. \$19.00

Ring Peavies, Common \$1 doz. \$18.00

Steel Socket Peavies \$1 doz. \$21.00

Setting Poles, \$1 doz. 12 ft. \$14.00; 14 ft. \$16.00; 16 ft. \$17.00

Swans Hooks \$1 doz. \$18.00

Champion Steel Socket Peavies per doz.

Maple Handles, 2½ in. x 1½ to 6 ft. \$24.00

Maple Handles, 2½ in. x 1½ to 6 ft. \$22.00

Maple Handles, 3 in. x 1½ to 6 ft. 29.00

Champion Solid or Split Socket Peavies—

Maple Handles, 2½ in. x 1½ to 6 ft. \$21.00

Maple Handles, 2½ in. x 1½ to 6 ft. 23.50

Maple Handles, 3 in. x 1½ to 6 ft. 26.00

Champion Cant Hooks, with steel clasps—

Maple Handles, 2½ in. x 4, 4½ or 5 ft. \$20.00

Maple Handles, 2½ in. x 4, 4½ or 5 ft. 21.50

Maple Handles, 3 in. x 4, 4½ or 5 ft. 25.00

Champion Cant Hooks, with maliceable clasps—

Maple Handles, 2½ in. x 4, 4½ or 5 ft. 17.50

Maple Handles, 2½ in. x 1 to 19.50

Champion Lug Hooks 28.00

Champion Skidding Tongue 72.00

Champion Swanup Hooks 22.00

Champion Pike Poles, ironed complete, 12 to 20 ft. 45 &

Cant Hook and Peavy Handles 45 &

Atkins' new list 40 &

Simonds' 33 & 5

Transom Lifters—
See *Lifters, Transom*.

Traps—
Game—

Blake's Patent 40 & 10 & 50 &

Newhouse 40 & 10 & 50 & 5 &

Oneida Pattern 75 & 75 & 10 & 5 &

Sensible 33 & 5

Davis' 32 & 5

Atkins' new list 40 &

Simonds' 33 & 5

Mouse and Rat—

Cyclone 45 & gr. \$1.25

Dandy 45 & doz. \$1.25

Hotchkiss Metallic Mouse, \$1 doz. traps, \$75; in full cases, \$1 doz. 60 & 65

Hotchkiss Imp. Rat Killer 7 gr. gro. \$18.50

Hotchkiss New Rat Killer 7 gr. gro. \$16.50

Ideal 7 gr. gro. \$10.00

Mouse, Bonanza 45 & doz. \$1.00

Mouse, Cage, Wire 45 & doz. \$2.50 10 &

Mouse, Catch-em-alive 45 & doz. \$2.50 15 &

Mouse Wood, Choker 45 & doz. holes, \$10 & 10 &

Mouse, Round Wire 45 & doz. \$1.50 10 &

Mouse, Sensible 33 & 5

Rat, Decoy 45 & gr. \$10.00 10 &

Rat, Sensible 33 & 5

Schuyler's Rat Killer 7 gr. gro. \$16.00

Waddie's Go Bang 45 & doz. \$12.50

Fly—

Balloon, Globe or Acme 45 &

Box, \$1.50; \$1.75, \$1.90 10 &

Harper, Champion or Paragon 45 &

Spittoons, "Daisy," 8 in. 8.50 4.00

Wash-Basins, 10½ in. 1.80 2.00

Wash-Basins, 12 in. 2.00 2.50

See also Pails.

Indurated Fiber—

Bassis, Ringed, \$1 doz. No. 2, 2.80

Silver Plated, Hollow-

4 mo. or 5% cash in 30 days
Meriden Britannia Co.
Reed & Barton.
Rogers & Brother.
Simpson, Hall, Miller & Co.
Hartford Silver Plate Co.
William Rogers Mfg. Co.

Washers—

Size hole..... 5 1/2 % 1/2 % to 1/2
Washers..... 5 1/2 4 1/2 3 1/2 2 1/2
In lots less than 200 lb., \$10 lb.; add 1/4 lb. per
box, 1/4 lb. to list.

Whips

American Whip Co.: Length. 4 ft. 5 ft. 6 ft. 7 ft. 7 1/2 ft.
X. L. Whalebone Driving. \$18.00 20.00 22.00 24.00 27.00 30.00 32.00 36.00
Bureka Two-thirds Whalebone. 15.00 16.50 18.00 20.00
Bull Bone, Half-length Whale bone.
American Standard. 8.00 8.50 9.50 10.50 12.00 13.50 15.00 16.50
True Grip, Raw Hide Center. 6.00 6.00 6.50 7.00 7.50 9.00
New Name, Stocked Java, Black and Wine Colors.
Americus, 93 Pen Whip. 6.00
Gents' Light Driving No. 111. 6.00
Gents' Light Driving No. 106. 5.00
Hand-made Stocked Java No. 108. 8.75 4.00
A large variety of cheaper grades.
Team Whips.
Toy Whips.
Hardware Assortment, 10/American, 75 Whips for \$50.00.

Wire and Wire Goods—**Iron—**

Market,

Washer Cutters—

See Cutters, Washers.

Water Coolers—

See Coolers, Water.

Wedges—

Iron. \$12 24 00 24 00

Steel. \$12 30 00 30 00

Weights Sash—

Ton lots at foundry. \$ ton, \$15.00 to \$16.00

Well Buckets Galvanized—

See Pails, Galvanized.

Wheels Well—

8 in. \$2.00; 10 in. \$2.50; 12 in. \$2.75

Stone,

Br. and Ann'd.

Nos. 16 to 18.

10

80¢

80¢

Extra 10%

Nos. 19 to 26.

80¢

80¢

often given.

Nos. 27 to 36.

80¢

80¢

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